STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

EDITORIAL STAFF

E. L. SHANER, *Editor*
E. C. BARRINGER, *Managing Editor*
E. C. KREUTZBERG, *Engineering Editor*

ASSOCIATE EDITORS

A. J. HAIN, G. H. MANLOVE, A. H. ALLEN, E. F. ROSS, J. D. KNOX

New York B. K. PRICE—L. E. BROWNE
Pittsburgh . . . E. A. FRANCE JR.
Chicago . . . . . W. G. GUDE
Washington . . . . . L. M. LAMM
London . . . . VINCENT DELPORT

Published by
PENTON PUBLISHING CO.
PENTON BUILDING
CLEVELAND, O.

JOHN A. PENTON, *Chairman of Board*
C. J. STARK . . . . *President*
J. D. PEASE . . . *Vice President*
F. V. COLE . . . . . *Secretary*

BUSINESS STAFF

GEORGE O. HAYS, *Business Manager*

New York
J. F. AHRENS, E. W. KREUTZBERG
Pittsburgh . . . . S. H. JASPER
Chicago . . . . . L. C. PELOTT

Cleveland
JOHN HENRY, R. C. JAENKE

R. T. MASON, *Circulation Manager*

Contents . . December 3, 1934

Volume 95 • Number 23

AS THE EDITOR VIEWS THE NEWS 9

NEWS OF THE WEEK:

Steel Has Slight Edge in Streamline Trains 10

Basing Point	10	Production	12
Labor	10	Structural Code	12
Meetings	11	Financial	12
Extras	11	NRA	12

Windows of Washington 13
Mirrors of Motordom 15
Exports Drop on Lower Scrap Shipments 16
Industrial Men in the Day's News 17
Here and There in Industry 18
Obituaries 18
Urges Lighter Steel Framework for Houses 19
EDITORIAL—Get in on the Ground Floor! 20
THE BUSINESS TREND 21

ENGINEERING DEVELOPMENTS:

Billet Chipping Machine	24	Use of Decalcomanias	36
Methods and Materials	27	Low-Alloy Cast Steels	37
Steel Wire in Springs	28	Steelmaking Progress	39
Press Jobs Hazardous	28	Counter for Strip Mill	40
Steel Piling for Caisson	30	Heat Treating Castings	42
Selecting Lubricants	31	New Equipment	46
Tobacco Cask Hoops	34	Trade Publications	52

MARKET REPORTS AND PRICES 53-74
CONSTRUCTION AND ENTERPRISE 75
ADVERTISING INDEX 92

NRA MEMBER U.S. WE DO OUR PART

BRANCH OFFICES:

New York . . . . . **220 Broadway**
Chicago . . . . **Peoples Gas Building**
Pittsburgh . . . . . **Oliver Building**
San Francisco . . . . **441 Merrit Ave., Oakland, Calif., Tel. Holiday 4290**
Washington . . . **National Press Building**
Cincinnati . . . **418-420 Sinton Hotel**
London . . . . . **Caxton House Westminster, S. W. 1**
Berlin . . **Berlin, N. W. 40, Roonstrasse 10**

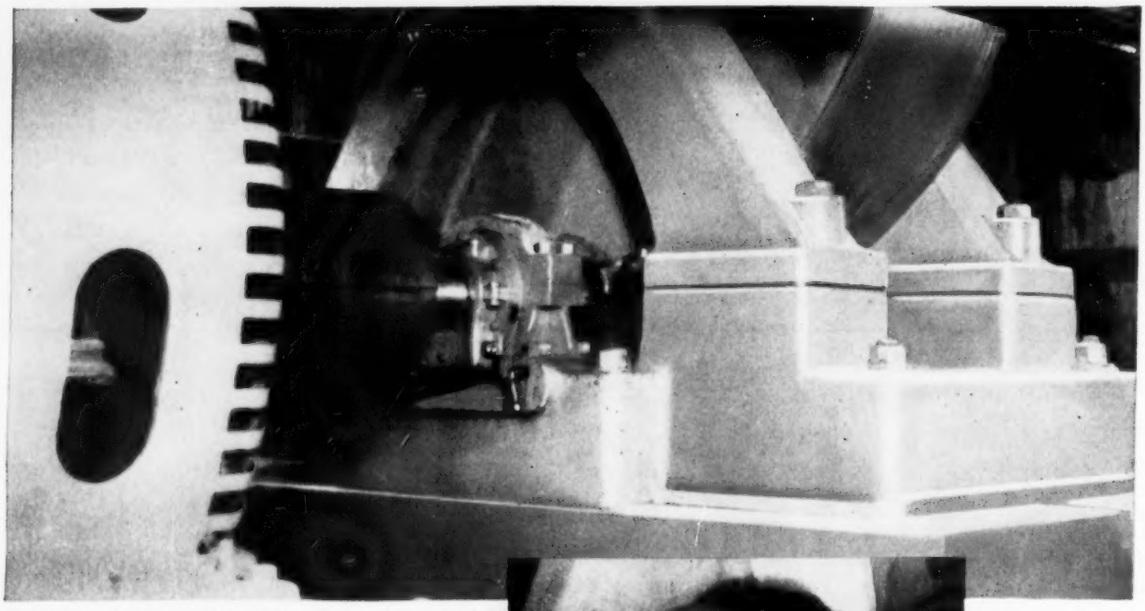
Member Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers Association.

Published every Monday. Subscription in the United States, Cuba and Mexico, one year $4, two years $6; in Canada one year $6.60, two years $11.20; in Great Britain and European countries, one year £2.

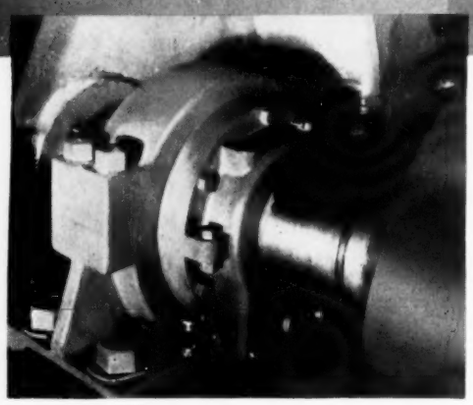
Entered as second class matter at postoffice at Cleveland under the Act of March 3, 1879.

Copyright 1934 by Penton Publishing Co.

Friction Fighting BRUTES



Rubber Grinding Mill Drive employing special double cage assembly, 6⅞" bore Fafnir Roller Bearing Pillow Block

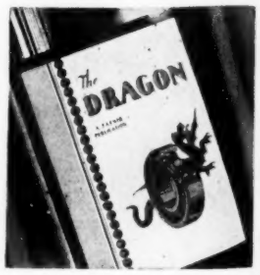


For the Tough Jobs

700 H.P. at 600 r.p.m. is the job assigned to these Fafnir Roller Bearing Pillow Blocks in a rubber grinding mill. It's typical of the installations which are occurring with increasing frequency—applications where the power savings which anti-friction bearings can deliver mount into large figures—where dependability is vital — where compact design is all-important. Fafnir Heavy Duty Industrial Roller Bearings are the economical answer.

In the illustrated application 40% to 50% was saved in power consumption, much more in lubrication costs, and Fafnir Roller Bearings practically eliminated the ever-present bearing breakdown problem despite the severe over-loads which frequently occur.

Fafnir offers a comprehensive line of heavy duty industrial roller bearings. Write for complete information. THE FAFNIR BEARING COMPANY, *New Britain, Conn.* Atlanta . . . Chicago . . . Cleveland . . . Dallas . . . Detroit . . . Milwaukee . . . Minneapolis . . . New York . . . Philadelphia.



News of the anti-friction bearing progress is the basis of every issue of "The Dragon." Let us add your name to the mailing list.

FAFNIR BALL BEARINGS

As the Editor Views the News

INDUSTRY seems to be entering a period in which its voice will be listened to with more respect. One can arrive at this conclusion from several angles. For instance, it is said that the government administration, in easing up on its bullyragging tactics, is attempting to encourage industry to assume more initiative. Another line of reasoning envisions a widening breach between industry-baiting new dealers and the more practical minded members of the administrative family (witness the Ickes-Moffett squabble), and suggests that the apparent ascendancy of the latter group will mean that industry is destined to play a more important role in future recovery plans.

• • •

Initiative Was Spurned in '33

Many industrialists have been waiting for this opportunity for months. Some of them would have exercised more initiative earlier if it had not been for the fact that in the formative stages of the new deal recovery program many individuals who attempted to voice proposals on behalf of industry were branded by brain trusters as "tools of Wall Street," Tories, etc. Industry's representatives were so thoroughly discredited by administration spokesmen during the last half of 1933 and first part of 1934 that no idea which they might have advanced—no matter how good—would have received respectful attention.

• • •

Offense Good Strategy Now

Regardless of this unfortunate experience of the past, industry now should step into the recovery picture more aggressively than ever. Its position is stronger strategically than at any time since March, 1933. Today the public realizes, as the new dealers did belatedly, that national recovery cannot be achieved under a program which restricts private enterprise too drastically. Industry should not only fight against legislation which will tend to further embarrass business but it also should advance ideas of its own for hastening and stimulating recovery. One weakness of industry's activity in the past 20 months was that it was so largely negative. Industry protested the proposals of others, but seldom advanced any on its own account. Industrial leaders know dozens of measures that would help recovery. They should propose these promptly, and then work hard for their acceptance. The time is ripe for an offensive thrust by industry.

• • •

Tonnage in Hoops, Springs

The extent to which small uses of steel mount into impressive tonnage is illustrated by two articles in this issue. From 1500 to 1800 tons of hot-rolled, beaded hoops are required annually for tobacco casks (p. 34), and this type of hoop is but one member of the large family of "slack barrel hoops," which in recent years has accounted for as high as 35,000 to 40,000 tons of steel annually. Wire springs for chairs, davenports and mattresses also run into large tonnage. One maker of spring units for mattresses (p. 28) uses fom 10 to 34 pounds of No. 14 gage wire per mattress and completes about 7500 units daily. Consumption of round spring wire for all purposes is estimated at 200,000 to 250,000 tons annually.

• • •

It's All in The Control!

Every designer, manufacturer, owner and operator of a machine or machinery in which the quick, accurate movement of a cutting head or similar part is important will recognize the significance of a new finger-tip control which has been developed for a billet chipping machine. A knob or handle (p. 24), provided with eight contactors which control the movements of the cutting head and work carriage, is responsible for speeding the operation of the machine so that billets for seamless tubes can be cleaned at a total cost ranging from 40 to 60 cents per net ton. . . . Decalcomania transfers (p. 36) are being used more extensively in industry for applying name plates, trademarks, instruction charts, etc. to machinery and equipment.

E. L. Shaner

Steel Has Slight Edge in Contest of Streamline Trains

THUS far it is practically a dead heat between steel and aluminum in the streamline train derby. Out of 15 complete trains that have been ordered by the railroads in the present wave of modernization, nine have gone steel and six aluminum; of a total of 71 cars in these trains, 33 are steel and 38 are aluminum.

In separate coaches ordered by the railroads, steel has a big lead, the New Haven and the Boston & Maine both having ordered a number of coaches of Cor-Ten and Man-Ten steel, both of which are high-tensile steels manufactured by subsidiaries of the United States Steel Corp.

Last week 20 street cars of Cor-Ten steel were ordered by the Capital Transit Co. of Washington, more than providing an offset for the aluminum street car made for Chicago.

Steel appears to have an edge in point of streamline equipment being built with PWA funds. The Union Pacific, which has been the flag bearer for aluminum, and the Burlington, which has given stainless steel tremendous publicity through its Zephyr, both used federal money.

The Baltimore & Ohio also has been impartial, planning to test both steel and aluminum in its trains, one of which will be drawn by a streamlined locomotive and the other by a diesel unit. But the Boston & Maine, the Illinois Central, the Gulf, Mobile & Northern, and the Texas & Pacific have gone either stainless or Cor-Ten.

So far as freight cars are concerned, aluminum has a heavy lead on test equipment, although special alloys are gaining. A typical hopper car recently built of high-tensile steel weighs only 30,000 pounds but has a load carrying capacity of 139,000 pounds.

Last week the New York Central announced it had constructed a Hudson-type passenger locomotive with streamline surfaces—a boost for steel.

The Score on Streamlining

Stainless Steel

Chicago, Burlington & Quincy, one 3-car steel train completed and two similar trains on order.
Texas & Pacific, one 2-car train completed.
Boston & Maine, one 3-car train on order.

Special Steel

Baltimore & Ohio, one 8-car Cor-Ten steel train on order.
Gulf, Mobile & Northern, two 3-car Cor-Ten steel trains on order.
Illinois Central, one 5-car Cor-Ten steel train on order.

Aluminum

Union Pacific, one 6-car and one 3-car trains completed and two 9-car trains on order.
Baltimore & Ohio, one 8-car train on order.
New Haven, one 3-car train on order.

Basing Point

RETURNING this week—probably Wednesday—from his southern vacation at Warm Springs, Ga., the President will find on his desk separate reports from NRA and the federal trade commission on iron and steel basing points.

In extending the iron and steel code, May 30, the President directed that a study be made of the pricing situation. Under the steel code, all pig iron producing points and nearly all steelmaking centers are basing points for products made there.

The speculation in Washington is that the trade commission's report is at least mildly critical of the present setup. The commission, which in 1923 ruled Pittsburgh-plus out, is known to favor making every steel plant a basing point. The burden of the NRA report is expected to be favorable to the present arrangement for pricing.

The NRA report was superintended by Dr. J. M. Clark of Columbia university, working directly under R. W. Shannon, deputy NRA administrator.

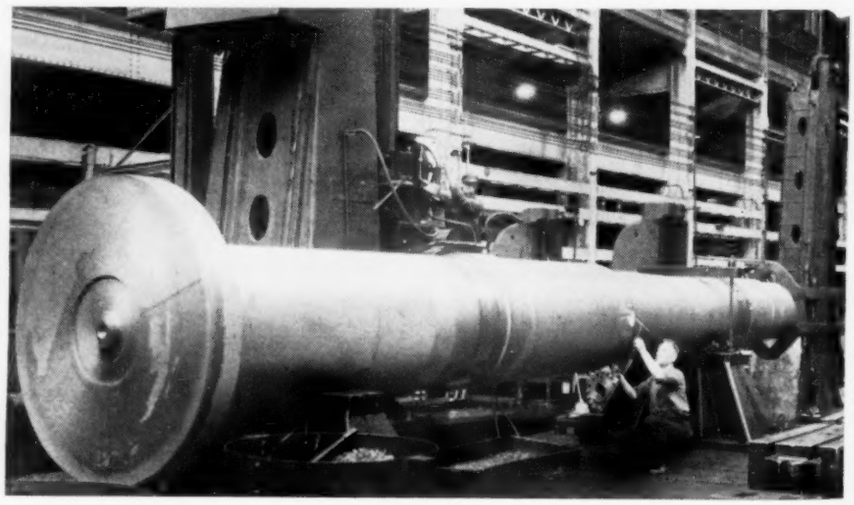
PROFESSORS DISSECT CODE

The steel industry's operations under its code of fair competition are going to be put under a collegiate microscope. For several months the bureau of business research of the University of Pittsburgh, in conjunction with the Brookings institute, Washington, has been engaged in a searching study of the effects of the NRA code on the steel industry. Supplementing the financial aid which the Brookings institute is offering, a grant has been made by the Maurice and Laura Falk foundation, Pittsburgh. Conclusions from this study will be published in the spring of 1935.

The following are concentrating their efforts on this study: Dr. Samuel S. Stratton, assistant professor of finance in the graduate school of business administration at Harvard university, on the cost and production angle; Dr. Carroll R. Daugherty, assistant professor of economics, University of Pittsburgh, on the labor angle; and Dr. Melvin G. de Chazeau, associate professor of commerce, University of Virginia, who is concentrating his study on distribution and price problems under the code.

Labor

PAYROLLS of the iron and steel industry in October of $32,723,909 were higher by $3,581,017, or more than 12 per cent, than in September, according to the American



NO HEART MURMUR IN THIS SHAFT for a Boulder dam generator which was drilled through end to end with a 6-inch drill and the hole reamed and polished to expose the slightest flaw in the core affecting the strength of the shaft. Weighing 106,000 pounds, the shaft is 392 inches long, 38 inches in body diameter and 64¾ inches in flange diameter. The illustration shows a milling machine cutting a keyway at the Westinghouse Electric & Mfg. Co. plant at East Pittsburgh, Pa. The generator in which this shaft will be mounted is of the vertical water-wheel type, having a capacity of 82,500 kv-a

Iron and Steel institute. Although operations in October were 50 per cent less than a year ago, payrolls were only 17 per cent under October, 1933. The number of employes totaled 381,431, against 381,828 in September and 416,277 in October last year. Employes averaged 26.8 hours per week, an increase of 11 per cent over the preceding month. Average hourly earnings for all employes were 72.3 cents, against 73.8 cents in September and 64.8 cents in October, 1933.

LABOR DELAYS STEEL TRUCE

Proposed truce between the steel industry and organized labor still was held up last week by inability of Michael F. Tighe, president of the Amalgamated Association of Iron, Steel and Tin Workers, and William Green, president of the American Federation of Labor, to decide which organization would represent labor.

Meanwhile, the national steel labor relations board is growing increasingly restive because it is faced with a decision on demands by the Amalgamated that it order elections at the Duquesne, Pa., and McDonald, O., works of the Carnegie Steel Co. The President may be drawn into the situation on his return to the White House this week.

HITS LABOR RACKETEERING

In an address at Boston last week, Donald Richberg, No. 1 spokesman for the President, conceded that "not all coercive labor organization is carried on by employers." He added: "Varying degrees of organizing pressure have been exerted against wage earners, from the more or less gentle persuasion by organizing committees of respectable unions down to the outrageous gun play and slugging of racketeer groups that prey upon the worker as remorselessly as any sweatshop employer."

FINALLY SUE HOUDE CORP.

Department of justice announced Friday it is filing suit in the federal court of western New York to compel the Houde Mfg. Corp., of Buffalo, to comply with the national labor relations board order decreeing majority rule of its employes for collective bargaining.

This brings into court a test case on the board's ruling that if elections have been held for representatives for collective bargaining, those selected by majority speak for all employes. Steel, among other industries, is opposed to majority rule.

Extras

AMERICAN Iron and Steel institute formally notified members Nov. 28 that mill quantity extras on plates and shapes, (STEEL, Nov. 26, p. 11) became effective Dec. 1.

Meetings

NATIONAL Machine Tool Builders' association, 1220 Guarantee Title building, Cleveland, has decided on Sept. 11-21 as the date for its 1935 machine tool exposition, to be held in the Cleveland public auditorium. Applications for space will be taken early in December. Herman H. Lind is general manager of the association.

A.S.T.M. SETS MEETING DATES

American Society for Testing Materials will conduct its thirty-eighth annual meeting in the Book-Cadillac hotel, Detroit, June 24-28, 1935. In connection with this meeting, the society is planning to hold its third exhibit of testing apparatus and related equipment. The society's 1935 regional meeting is scheduled for March 6 in Philadelphia, with the technical program featuring a symposium on paint sponsored by committee D-1 on preservative coatings for structural materials. The spring group meetings of committees will be held in Philadelphia during the same week, beginning on March 4 and running through March 9.

FERRO CLUB ENTERTAINS

The Ferro club, a social organization of scrap dealers and brokers in the Philadelphia district, held its semiannual entertainment the night of Nov. 27. William L. Forebaugh, Luria Bros. & Co. Inc., president, presided. More than 40 members and guests attended.

SCRAP CONVENTION TO N. Y.

Seventh annual convention of the Institute of Scrap Iron and Steel will be held in New York Jan. 15-17. A convention committee has been appointed by the New York chapter of the institute, which will act as hosts to the members of the institute, with P. W. Bowers, of P. W. Bowers & Co., general chairman; George Betten, of S. Betten & Sons, general secretary; Thomas F. Kelly, general treasurer. The convention committee, at its first meeting held recently, selected the Hotel New Yorker as convention headquarters.

¶Chicago chapter of the American Society for Metals will be addressed Dec. 13 at the Medinah club by D. K. Crampton, chief metallurgist of the research department of the Chase Brass & Copper Co., on "Copper and Copper Alloys."

¶Among companies to be represented at the Cleveland exposition Dec. 29-Jan. 6 when industries of Cleveland and northern Ohio will exhibit their products and processes, are Republic Steel Corp., Lamson & Sessions Co., Thompson Products Inc.,

AT HARNISCHFEGER GOLDEN ANNIVERSARY: More than 1000 visitors were open-house guests of the Harnischfeger Corp. at Milwaukee, Nov. 17, an occasion which combined the corporation's 50th anniversary celebration with the showing of the four 300-ton electric cranes built for the government for installation at Boulder Dam in the largest single power house crane installation on record. From the top of the trolleys, 20 feet above the floor, visitors inspected the units from all angles. These cranes, with a 64-foot span and a lift of 70 feet, are of the double trolley power house type. Some idea of their size and capacity may be gained from the fact that eight electric motors are used on the bridge drive alone with a combined output of 410 horsepower for each crane. They will be used for handling the mammoth 600-ton hydroelectric rotor generators, the largest of their kind ever built. Other features of the afternoon program included exhibits of the various divisions of the corporation with showings of the largest and smallest cranes as well as the operation of the newest types P&H gasoline, diesel and electric drive excavators on the test field adjoining the plant

Browning Crane & Shovel Co., Boom Boiler & Welding Co., Globe Machine & Stamping Co., Henry Furnace & Foundry Co., Iron Firemen Mfg. Co., and Lake City Malleable Co.

Structural Code

REPRESENTATIVES of the NRA industrial advisory board and a special committee of NRA appointed to consider the structural fabricators code held two conferences last week without reaching a decision. It now appears that the matter will be reported back to the advisory council without any recommendation.

It is possible that a compromise may be worked out, giving the industry a 90-day code to take care only of wages, hours and trade practices. Fabricators have stongly opposed the code General Johnson attempted to force upon them after he deleted sections relating to erection and inserted them in the construction industry's code.

Financial

REPUBLIC STEEL CORP., Cleveland and Youngstown, O., on Nov. 28 docketed the largest single file for registration in the brief history of the securities and exchange commission (SEC). It registered four classes of securities for a total of $67,877,839, in connection with its proposed absorption of the Corrigan, McKinney Steel Co. and Truscon Steel Co.

Estimated expenses of the consolidation and reorganization of the Republic financial structure is estimated at $1,200,000, plus 50,000 common shares valued at $625,000 to two financial houses, and payments for solicitation of stock for deposit. Expenses include $200,000 for taxes, $125,000 for printing, $350,000 for legal expense, $175,000 for advertising, $125,000 fees to transfer agents, $125,000 accounting expenses and $50,000 miscellaneous.

MUST FILE FOR FOLLANSBEE

Follansbee Bros. Co., Pittsburgh, through trustees John Follansbee George T. Ladd and Isaac M. Scott, are notifying creditors that the latter shall file all proofs of debt with William E. Schoyer, Union Trust building, Pittsburgh, on or before Jan. 1, 1935. All creditors failing or omitting to do so shall not participate in the assets of the Follansbee company or in any plan of reorganization.

CONTINENTAL PAYS PREFERRED

Continental Steel Corp., Kokomo, Ind., has declared the regular quarterly dividend of $1.75 on its preferred stock, payable Dec. 20 to record of Dec. 10. This dividend is earmarked for the fourth quarter of 1934. It is the second payment since July 1, 1931; on Oct. 1 of that year a similar disbursement was made on the accumulation.

Protest Efficiency Experts

A UNITED PRESS dispatch from London states that five employes of a wire works in Manchester, Eng., have applied to chancery court for an injunction to restrain their employers from using American efficiency methods. They complain of efficiency experts with notebooks, stopwatches and other devices checking their rates of production and "almost breathing down our necks." All this, the workmen contend, is a breach of their union agreement.

Production

STEEL production slipped back 1 point last week to 28 per cent, due largely to a slight recession in schedules of producers over the holiday. Indicated increases of 1, 2 or 3 points this week in the Pittsburgh, eastern Pennsylvania and Youngstown districts, and an unstated gain in the Chicago district will probably pull the rate out of the Thanksgiving rut. Details for various districts follow:

Youngstown—Held unchanged at 35 per cent last week, and at this week's start the rate will be up 2 points to 37 per cent.

Pittsburgh—Down 1 point to 20 per cent through last week, owing to the Thanksgiving holiday. A leading local interest operated at 24 per cent through last week. Led by an increase in prospective demand for sheet and tin bars, the average of ingot operations in this district should advance to 21 or 22 per cent this week.

There has been no change in the number of active steel works blast furnaces, Carnegie Steel Co. scheduling 7 of 32; Jones & Laughlin Steel Corp., 3 of 11 and Bethlehem Steel Co., at Johnstown, Pa., Pittsburgh Steel Co., at Monessen, Pa., and Pittsburgh Crucible Steel Co., Midland, Pa., one each.

Chicago—Increased fractionally to about 33½ per cent, with another small gain in prospect this week. Both operations and specifications the past week were at the best level in nearly five months. Blast furnace operations are unchanged with eight of 36 steelworks furnaces active.

Central eastern seaboard—Off 1½ points to 18½ per cent, with the holiday last week a factor. A rebound of at least two or three points is expected. Some producers closed down certain of their finishing departments last Wednesday night for the remainder of the week.

Cleveland-Lorain—Unchanged at 46 per cent, Corrigan, McKinney Steel Co. operating seven open hearths, Otis Steel Co. five, and National Tube Co., Lorain, six. The latter has scheduled eight for this week. Finishing mills shut down for Thanksgiving day, but open hearths continued in operation.

Wheeling—Held at 54 per cent last week, with 20 out of 37 open-hearth furnaces in the district active. A leading producer in the district scheduled one less active open hearth last week, but another interest added an open hearth at mid-week.

New England—Went off 8 points last week to 47 per cent, contrary to expectations. Indications are that ingot production will hold at this level this week.

Birmingham—Advanced 2½ points last week to 27½ per cent, the first notable increase since the first week of September. Tennessee Coal, Iron & Railroad Co. is producing ingots in five of its open hearth furnaces at Fairfield. These rail mills are scheduled to operate for a week or ten days.

Buffalo—Continued at 24 per cent last week. No change in production of major nature is in sight and most producers look for December to be a dull month, with operations declining as usual toward the end of the period. Nine open hearths continue in production here.

Detroit—Unchanged at 48 per cent last week, with nine open hearths in the district continuing active.

Dawes Sees Steel Rising

STEEL prices are going to rise on May 8 following a swift bulge in consumer buying, according to a study made by Charles G. Dawes, Chicago banker and former vice president.

In recent address, Eugene R. Black, governor of the Atlanta Reserve bank and former head of the reserve board in Washington, quoted General Dawes as stating that charts of the depressions of 1873, 1893 and 1907 show clearly that the end of the depression in steel is at hand and that striking developments are in prospect in the spring.

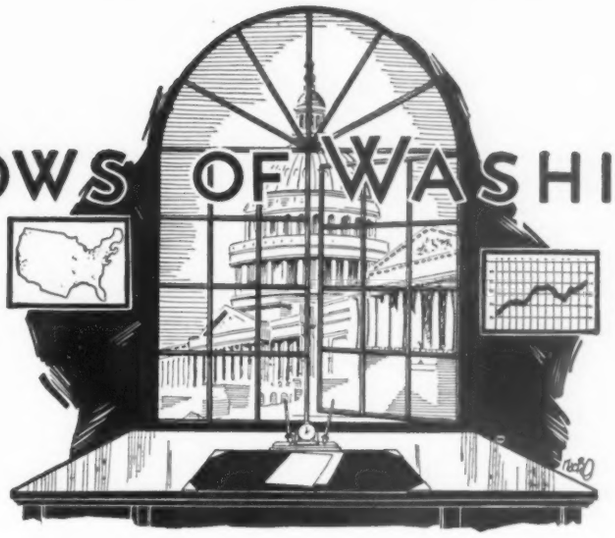
NRA

TO TIGHTEN up on code compliance NRA last week named Sol. A. Rosenblatt, director of field administration and enforcement, to direct that division and co-ordinate with it the activities of the litigation division.

At the same time, the NRA industrial recovery board authorized the

(*Please turn to Page 74*)

WINDOWS OF WASHINGTON



WASHINGTON

NOTWITHSTANDING the incredible confusion that has been created at Washington, principally by the left wing of the administration, since the President departed on his southern trip, the conviction remains unshaken that the stage is being set for an upswing in business that will exceed the improvement both of this year and last.

In fact, this very confusion supports such an expectancy. The bickering and ferment and the trial ballooning of pet theories and projects are virtually confessions of weakness by radicals; they arise primarily because these left wingers no longer completely dominate the situation—because enough conservatives (comparatively speaking) to interpose an opposition have broken through.

When the discord between Perkins-Tugwell-Ickes-Hopkins on the left and Moley-Roper-Moffett on the right, with Richberg in the middle but pulling over to the right, is dissected, it simmers down to this:

Both factions agree that a reduction of unemployment is the basic, pressing problem confronting the administration. This in itself is an advanced position. But—the leftists would stimulate employment by a spending program that would make the billions already spent appear niggardly, while the rightists are for encouraging business to do the job. The difference is one of method, not objective.

HEAVY INDUSTRIES BENEFIT

For the long pull, of course, reemployment through business is the only lasting cure, but for the short pull, say two years, business will win regardless of which view prevails. Increased demand for materials and equipment produced by the iron, steel and other so-called heavy or durable goods industries is assured. If it does not originate with private enterprise it will through the government.

Housing best illustrates the conflict. Housing Administrator Moffett, a former Standard Oil executive, is waging an elaborate campaign to entice private initiative back into the building field. By a good many, this housing program appears to offer more to business than any previous government hypodermic.

PWA Director Ickes, fearing that private builders will not act quickly enough to provide a substantial volume of employment early in 1935, is proposing a two-billion dollar housing program as part of a new public works setup. Either the government would proceed to build low-cost housing on a large scale or funds would be loaned to private corporations which would undertake large projects.

MOFFETT VS. ICKES

Here the issues are perfectly joined. Moffett is conservative; Ickes is at least a liberal. Moffett would stimulate individuals to build houses; Ickes would have the government do it. Moffett would insure bank loans at 5½ per cent; Ickes proposes to put federal funds at 3 per cent into the building industry. Moffett would have private owners amortize their loans over a normal period; Ickes would grant an indefinite period.

Nevertheless, for steel and other industries producing building materials the important fact is that, whichever arm of the government wins, building is going to be stimulated. Either it will be scattered, medium to low-price housing built with FHA money, or it will be large-scale low-price operations with PWA funds.

From the economic viewpoint, probably the Moffett proposal is the sounder, but steel might fare better by such a mass construction as Ickes urges. Incidentally, although almost daily FHA is contacted by steel producers or fabricators awakening to the potentialities of steel in the home, lumber interests believe they have housing so well sewed up they contemplate another rise in prices.

HOW MUCH TO SPEND?

Housing, of course, is only one facet of the spending program. It is a direct approach to the President's heart, as witness his statement last week that the government will take care of "the little fellow" who cannot borrow at the bank to buy or build a house.

But the burden of the left wing's approach on this spending program is that, no matter how much private initiative may desire to get things going and spur re-employment, it cannot be done rapidly enough to help this winter, hence the necessity for giving Mr. Ickes an unlimited spending account.

Thus far the President has avoided any semblance of a position on a PWA program other than to ridicule reports it would be as much as twelve billions. Reports of two to twelve billions are only so many trial balloons. If the program is 3½ billions or less it will be a sign that the right wing has won; if it tops that figure, the leftists have won. But either way, business also will win—at least for the time being.

MANY of the other issues over which the right and left wings have locked horns also augur well for business, and almost invariably they indicate that the left is losing its hold.

In the hands of such a moderate and well-balanced group as Messrs. Williams, Whiteside, Marshall, Harriman, Hillman, Witherow and others, NRA is palpably marking time. A quiet job is being done in separating inexperienced, young and radical minds from the organization.

Incidentally, while General Johnson originally put a $6000 top on

NRA salaries, it developed that 90 have been paid $6000 to $12,000; 350 have been receiving $3500 or more, and 109 lawyers $4500 to $8500.

The left wing and some radical writers in Washington have been suspicious that NRA is going conservative, and that a policy of marking time until the situation was surveyed, with an eye to a legislative program, is the equivalent of scuttling NRA. This has infuriated those with a sadist outlook on business.

In any event, some form of NRA seems certain to survive the expiration of the recovery act June 16, and it is a "break" for business in the present period of recuperation that NRA is not prodding it and that the Williams-Whiteside group will be a factor in its new setup.

What could be more assuring to business than this pronouncement by William H. Davis, former director of compliance, who is now a special adviser:

It is fundamentally important that the country should understand that code enforcement is going to be conducted within the law; that it will be carried on in accordance with the temper of our people along the well-trodden paths of constitutional procedure.

Business is the winner from the about-face that Relief Administrator Hopkins, a Sinclair sympathizer, has done on relief. A policy of work relief instead of doles implies greater use of materials and equipment. Abandonment of the 30-cent hourly minimum and placing relief allotments on the basis of prevailing wages eliminates considerable labor unsettlement, especially in the South.

RETURN TO ORTHODOXY

Even in the agricultural adjustment administration the trend is reassuring. Permissible increases in crop acreage for 1935 are the forerunner of more intensive utilization of farm implements, and some 1934 checks will find their way back into the tills of implement dealers.

Organized labor, too, has been put on the defensive by the trend to the right. Each passing day that business improves puts labor's great opportunity for mischief-making one day farther into history. Even Mr. Ickes assisted the right wing when he recently suggested a reduction in building trade wages.

There is considerable speculation whether labor would be put in a hole if the administration proposed that it make a contribution to recovery by accepting a reduction in wages—say 10 per cent—for a year, provided commodities also were lowered voluntarily.

As re-employment increases, the field for sowing organization propaganda narrows, but with this danger to steel and automobiles—that the American Federation of Labor, feeling particularly frustrated in these industries, is likely to concentrate on them.

There is not an important branch of the government—NRA, AAA, housing, attitude toward labor, and so on—in which business cannot detect encouragement. The confusion is largely the confusion of its enemies.

WHILE only in the nature of trial balloons, the increasing quiet talk in Washington about large corporations using their surpluses and their reserves for depreciation and obsolescence for the purchase of new equipment evidences the concern felt for the durable goods industries.

From the Washington viewpoint, the release of such reserves by only a few large interests would break the jam. There is a feeling that, in view of the reasonable certainty that the worst is past, industry can afford to take the lead and can, in effect, lift itself by its bootstraps.

FUNDS ALL ON BOOKS

In the case of the United States Steel Corp., the charge in 1933 for depletion, depreciation and obsolescence was $43,195,117.06. In 1932 it was $39,321,603.42. Bethlehem Steel Corp. in 1933 set aside $13,506,256 for these items, and in 1932, $13,101,589. National Steel Corp.'s depreciation and depletion reserve last year was $3,091,680.

While realizing that bookkeeping methods vary and by no means do these figures connote so much cash on hand for replacements, Washington nevertheless is figuring that somehow or other, having made adequate bookkeeping allowances, industry—of which it regards steel as typical and not to be singled out—could loosen its purse strings at these times and give recovery a fillip.

Surpluses also appear juicy morsels to Washington and, as with reserves for depreciation and obsolescence, some new dealers seem to regard surpluses as so much cash that is idle. As of last Dec. 31 the undivided surplus of the Steel corporation was $287,300,506.70, while to cite two typical independents, the surplus of Bethlehem was $81,145,825 and of National Steel $48,815,578.

It may be that the noteworthy increase in dividends, and also some recent extra dividends, are due to the suggestion passed out at Washington that surpluses and reserves should be used now. Such a gesture by industry might soften the hearts of legislators in voting new taxes.

Speaking of the durable goods industries, it will be recalled that last April a most voluminous report was submitted to the President and General Johnson. This report was the culmination of some months of study and investigation, and cost $100,000. It has not yet been acknowledged by the White House or the general.

THE present disagreement between the right and left wings of the administration probably will seem as nothing compared with developments when the left wing, headed by Secretary of Labor Perkins and Relief Administrator Hopkins, get to battling over social legislation at the coming session of congress.

When a statement by the President early in November was interpreted to mean that he favored going no farther than unemployment insurance at the coming session of congress, the Perkins-Hopkins clique promptly asserted that this was not the President's intention, then lapsed into silence. But behind that silence considerable work is being done.

At present it appears that Sen. Robert F. Wagner, of New York, who has a complex on company unions, and Rep. David J. Lewis, of Maryland, will lead the fight for unemployment insurance. Plans are subject to change almost daily, but it looks as if a payroll tax of about 5 per cent will be voted.

In the year ended August, 1934, the first full year of the steel code, the steel industry's payroll totaled $470,000,000, of which 5 per cent would be $23,500,000—a tidy sum even for the bureaucrats in Washington. And steel is only one major industry. Automobiles, rubber, the railroads, chain stores, etc. would supply the proposed new unemployment insurance commission with solid nourishment.

CO-ORDINATE STATE PLANS

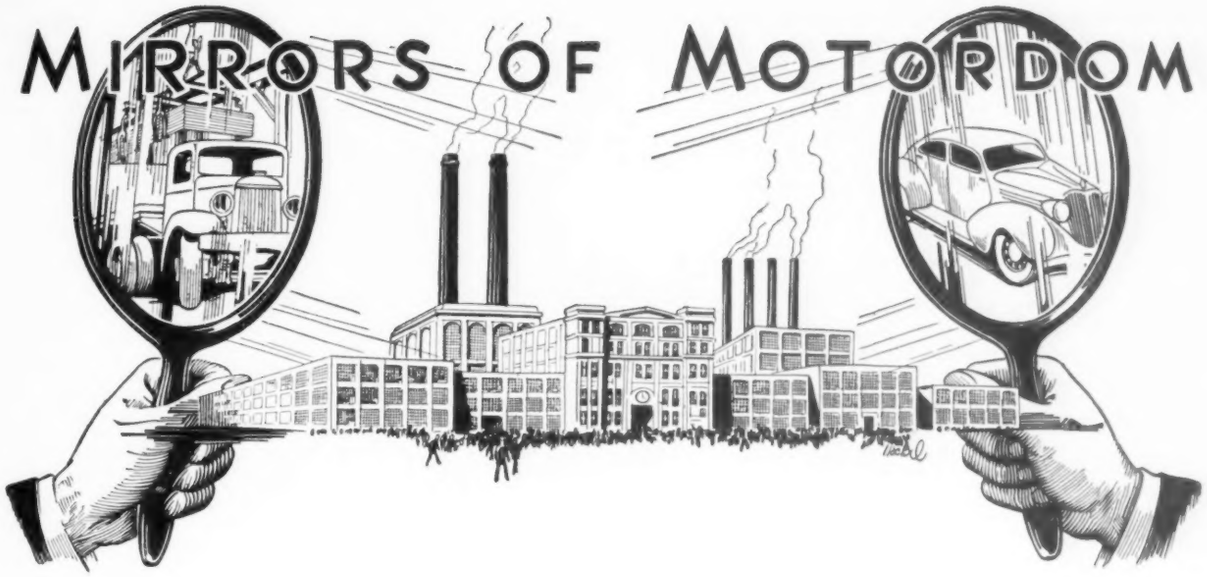
Should the President put it up to congress to stop with unemployment insurance he probably would prevail, although the probable petition of some 15,000,000 names for old-age pensions will call for much tact. But the social reformers are not counting alone on congress.

The program of Miss Perkins is to have the various states adopt unemployment insurance, old age pensions, sick and accident insurance and other measures. Through her department she is attempting to co-ordinate the programs of the states. If, as and when a majority of the states adopt such measures, congress is expected to be a pushover for similar laws.

Every social reformer has or will submit a special plan for these social measures. There is also the possibility of some of the larger insurance companies entering the field if there is any optional provision. One company, for example, is understood to have studied the retirement pension problem of a large eastern trunk line and to have found it could do the job at one half the cost the railroad is now under.

There is some talk that industry may co-operate with conservatives and propose a plan of its own.

MIRRORS OF MOTORDOM



DETROIT

CHRYSLER, as expected, is leading the way among the Big Three in assembly of new models. Chrysler, Dodge and Plymouth are back in production and although output currently is limited, a rising schedule is in prospect. Ford was not quite ready to go last week, while Pontiac recently was General Motors' sole contributor to new cars, with Oldsmobile scheduled to swing into line momentarily.

By the same token, Chysler has been relatively the best source of orders for steel and other materials. Steel business generally continued to improve last week, and producers see this trend as not only firmly established for several months but also due to gather considerable momentum soon when Ford and Chevrolet become more active participants in the market.

Ford recently has been building only a handful of cars daily—practically hand-made jobs—and releases still are awaited on large lots of certain vital parts. However, the date of resuming assemblies is regarded as imminent, with fairly heavy production schedules and steel releases in prospect before the end of this month.

OTHER MAKERS LAY PLANS

Chevrolet has been taking inventory in certain departments and will not be ready to assemble new models for several weeks. The gear and axle plant here was to resume operations this week on production of new parts after having been engaged in taking inventory the past two weeks. Assembly lines shortly will complete their run on 1934 models, but the changeover to the new series is not expected before the middle of December at the earliest.

Ford expects its new design to overcome one of the principal objections to its former models. Admittedly outstanding in motor performance, the V-8 series still left considerable to be desired in riding comfort, a fault most noticeable to backseat riders. This objection will be met next year by a longer car and a rearrangement of the motor and rear seat in relation to the two axles. Murray, incidentally, will build some frames for Ford next year, supplementing the latter's own production.

Various reports are heard as to the exact dimensions of the Ford wheelbase and body length and regarding location of the engine, but it appears that the net result of the forward movement of the engine and the small increase, if any, in wheelbase will contribute to about 8 inches more leg room in the new models.

Widening of the body makes the rear fenders decidedly narrow. While adhering in principle to the type of springs formerly used, a change is understood to have been made in the Ford front suspension which locates the spring somewhat forward of the axle.

Pontiac also has moved the engine slightly forward in its 1935 models now being built. Chief distinguishing features of the new Pontiac bodies are the steel roof, back slope and V windshield that includes a dividing bright-metal strip. These characteristics are expected to be found on other General Motors cars also next year. Unlike the design of some other body builders, the Fisher roof is a single stamping that extends down over the sides of the body where it is welded, rather than being simply a steel sheet which replaces the fabric section commonly used heretofore.

Plymouth's new cars, recently being assembled at the rate of about 1200 weekly, reveal the LaSalle influence in their narrower radiator and round hood louvres. Front fenders are bulkier, while the body rear has a decided slope. The slope, although less pronounced than on the airflow models, resembles the latter to a certain extent.

CHANGE AIRFLOW LINES

Dodge bodies have received a similar treatment, with the rake of the radiator grille increased. Chrysler's conventional cars, on which production has been started, will have a narrower radiator, while on airflow models the front-end lines have been altered by a rounded radiator grille that projects from, rather than follows, the downward sweep of the hood.

Among the independent companies, Hudson and Studebaker make the best showing. The former is pushing operations to accommodate initial orders from dealers, having been forced

Automobile Production

Passenger Cars and Trucks—U. S. Only

By Department of Commerce

	1932	1933	1934
Jan.	119,344	128,825	156,907
Feb.	117,418	105,447	231,707
March	118,959	115,272	331,263
April	148,326	176,432	354,745
May	184,295	214,411	331,641
June	183,106	249,727	308,051
July	109,143	229,357	266,575
Aug.	90,325	232,855	234,809
Sept.	84,150	191,800	168,872
Oct.	48,702	134,683	132,448
Year to date	1,203,768	1,778,809	2,517,084

Estimated by Cram's Reports

Week Ended	
Nov. 3	17,116
Nov. 10	16,820
Nov. 17	16,810
Nov. 24	13,000

(Estimate for week ended Dec. 1 delayed by Thanksgiving holiday).

to turn down some business for December delivery. Production of about 5000 Hudson and Terraplane cars by the first of the year is anticipated. Near-depletion of dealers' stocks of 1934 models is one reason for hastening deliveries of the 1935 series.

Studebaker has scheduled 8000 units for the rest of the year and will announce its new line Saturday. New models incorporate changes in both appearance and mechanical parts, and include hydraulic brakes, a new front spring suspension and overdrive transmission. The radiator is narrower while the forward ends of the horizontal hood louvres slope downward up to the sides of the radiator.

Nash also will adopt hydraulic brakes next year and will offer the overdrive transmission. Front springs have been lengthened to equal the dimension of the rear springs, so that their combined length covers most of the extent of the car. The company will start assemblies of new models shortly, having been down for machinery changes recently. Nash cars will be offered first, with introduction of the new Lafayette likely to be deferred until spring.

PLACE EQUIPMENT ORDERS

Ford has closed on most of the equipment it will buy in connection with its $20,000,000 improvement program. A week ago Edsel Ford reported that contracts already let for plants and machinery involved $16,000,000, at the same time taking opportunity to squelch reports that the company had agreed to file a certification of compliance with the automobile code.

Ford recently bought a sizable number of diamond point drills to be used for boring cylinder blocks, while it is understood that crankshaft bearings are being broached instead of turned, in the interest of a saving in time and money.

Concentrating on the manufacture and sale of present models rather than on the development of new ones, Buick recently has been enabled to increase output to meet better retail demand. From an output of 650 cars two weeks ago, schedules are expected to be stepped up to 1000 weekly in December. Hupmobile also has boosted its production moderately, while Graham was down last week for inventory. Reo's assembly operations are confined to commercial cars, being engaged otherwise in preparations for 1935 passenger car production. Reo has just closed a contract with the Midland Steel Products Co., Cleveland, for frames and brakes.

Now that the number of manufacturers resuming operations the past two weeks has exceeded those shutting down, the outlook for rising production becomes more favorable. November output showed little change from the corresponding 1933 month, and December should register an improvement over last year, provided Ford assemblies expand in the manner anticipated.

The industry generally is far better off than it was a year ago in regard to preparatory work on tools and dies and, except in cases where production has been delayed purposely, will be in a more favorable position to meet early demand for new models.

McCord Radiator & Mfg. Co. shortly will complete the first installation of its fuel-refrigeration-air conditioning system on a passenger bus which will operate between Los Angeles and El Paso. The system uses propane, a distillate of crude oil, which serves first as a refrigerant and then passes to the engine as fuel. Since propane costs about the same on a performance basis as gasoline, the upkeep of the system is virtually cost-free.

Franklin Motors Inc., a new company, has been incorporated to take over the H. H. Franklin Mfg. Co., which filed a voluntary petition in bankruptcy last April. The new company plans to market a lower-price air-cooled car.

Two other comebacks also will be attempted. John N. Willys was conferring in Toledo last week with receivers for Willys-Overland and said "I am going to continue to try to put this plant back in the sun." At Chicago, the Stanley Steam Motors Corp. was being organized to revive the Stanley name in the manufacture of steam-propelled buses and trucks.

Steel Exports Off As Scrap Slackens

EXPORTS of steel and iron products in October, at 220,209 gross tons, declined 81,121 tons from the total of 301,330 tons exported in September, according to statistics of the iron and steel division of the department of commerce. This is the lowest total since June, 1934. However, the decline was caused almost entirely by smaller exports of scrap, which shrank 77,999 tons from 225,212 tons in September to 147,213 tons in October. Tin plate dropped from 17,752 tons in September to 14,793 tons in October, a loss of 2959 tons, and structural shapes from 4983 tons in September to 2946 tons in October, a decline of 2037 tons. Other items remained practically unchanged.

Complete statistics of steel and iron imports for October were presented in STEEL, Nov. 26, p. 14.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1934		1933	
	Imports	Exports	Imports	Exports
Jan.	22,653	178,023	21,892	56,720
Feb.	25,407	151,184	19,748	63,936
Mar.	38,393	261,269	22,114	80,567
April	26,862	201,539	28,061	100,395
May	29,465	241,753	26,295	123,069
June	24,848	219,406	34,368	102,581
July	17,676	233,186	52,805	83,311
Aug.	32,418	242,947	46,839	119,374
Sept.	23,847	301,330	55,706	108,799
Oct.	20,202	220,209	46,673	164,755
10 mo.	261,781	2,250,846	354,283	998,958
Nov.	.....	.....	28,979	157,600
Dec.	.....	.....	31,310	184,585
Total	.....	.....	414,790	1,350,692

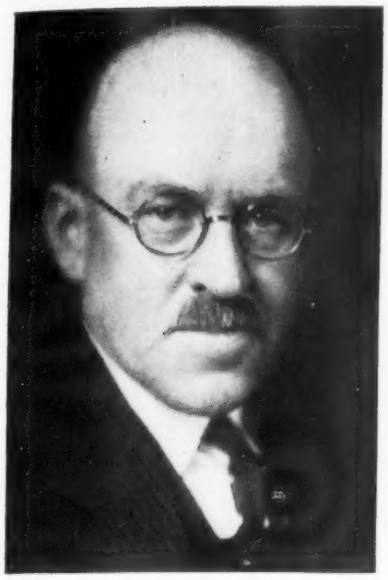
UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Commodity	Oct. 1934	Sept. 1934	Jan. thru Oct. 1934
Pig iron	273	379	2,890
Ferromanganese, spiegeisen	41	.....	85
Iron and steel scrap	147,213	225,212	1,422,627
Ingots, blooms, billets, slabs and sheet bars	5,069	430	14,280
Bars, iron	40	70	826
Bars, steel	3,133	3,917	33,924
Bars, alloy steel	221	228	2,410
Wire rods	483	1,293	19,564
Boiler plate	56	964	1,825
Other plate, not fabricated	1,867	3,404	27,767
Skelp, iron or steel	2,655	1,140	63,015
Iron sheets, galvanized	106	99	1,194
Steel sheets, galvanized	5,496	6,500	54,711
Steel sheets, black	6,142	6,078	71,149
Iron sheets, black	307	284	3,843
Strip steel, cold rolled	798	737	11,448
Hoop, band and scroll iron or steel	848	342	12,281
Tin plate, terne plate	14,793	17,752	154,869
Water, oil, gas and other tanks, except lined	1,205	183	5,938
Shapes, not fabricated	2,946	4,983	28,132
Shapes, fabricated	1,783	2,694	14,653
Plates, fabricated	100	187	2,136
Metal lath	105	86	970
Frames, sashes and sheet piling	870	88	2,752
Rails, 50 pounds	1,913	2,613	53,580
Rails, under 50 pounds	140	213	4,530
Rail fastenings	141	843	9,203
Switches, frogs, crossings	151	155	1,422
Railroad spikes	224	156	2,782
Railroad bolts, nuts	54	53	1,196
Boiler tubes, seamless	680	1,073	6,314
Boiler tubes, welded	23	12	343
Casing and oil-line pipe, seamless	2,399	2,706	42,176
Casing and oil-line pipe, welded	605	340	9,212
Seamless black pipe, other than casing, etc.	179	172	2,771
Malleable iron screwed pipe fittings	293	203	2,544
Cast iron screwed pipe fittings	106	1,006	2,261
Cast iron pressure pipe and fittings for	1,224	346	9,160
Cast iron soil pipe and fittings for	923	211	2,771
Welded black steel pipe	1,718	2,070	17,266
Welded black wrought iron pipe	116	45	1,277
Welded galv. steel pipe	2,542	1,658	20,509
Welded galv. wrought iron pipe	61	45	660
Riveted iron or steel pipe and fittings	66	5	406
Plain iron or steel wire	1,325	1,576	13,013
Galvanized wire	1,663	1,661	18,652
Barbed wire	3,021	2,659	30,915
Woven wire fencing	96	120	1,101
Woven wire screen cloth	56	164	835
Wire rope	257	219	2,321
Other wire and mfrs.	286	444	4,025
Wire nails	887	875	11,140
Horseshoe nails	70	58	629
Tacks	34	39	422
Other nails, staples	261	241	3,189
Bolts, machine screws	394	450	4,174
Iron castings	491	354	6,062
Steel castings	304	284	1,994
Car wheels and axles	566	779	4,975
Horseshoes	9	41	138
Iron and steel forgings, n. e. s.	381	391	3,598
Total gross tons	220,209	302,330	2,250,846

Industrial Men in the Day's News

Ralph E. Flanders, New President, American Society of Mechanical Engineers



Harris & Ewing Photo

HE is an authority on machine tool design and shop management, has written extensively on these subjects.

ASSOCIATED with various machine companies since 1897, he now is president of a leading lathe building interest.

AS a member of the industrial advisory board of NRA, his name has been featured prominently in the news.

RALPH E. FLANDERS, who this week will be formally elected president of the American Society of Mechanical Engineers at its annual meeting in New York, is president of the Jones & Lamson Machine Co., Springfield, Vt., and lately has become well known for his efforts to aid recovery in the capital goods industries.

Born in Barnet, Vt., he was educated at the high school in Central Falls, R. I., later becoming an apprentice for Brown & Sharpe Mfg. Co., Providence, R. I., serving there as machinist from 1897 to 1900 and as draftsman from 1900 to 1902. At that time he became connected with the Taft-Peirce Mfg. Co., Woonsocket, R. I., and a year later removed to New Hampshire with the International Paper Box Machine Co. at Nashua.

His next association was for a period of seven months with the General Electric Co. at Lynn, Mass., after which, in 1906, he became associate editor of *Machinery*, continuing as such until 1910. Then for two years he was engineer in the sales department of the Fellows Gear Shaper Co., Springfield, Vt., later specializing on engineering work in connection with the making of cutters and methods of gear cutting.

In 1912 he was named manager of the Fay lathe department of Jones & Lamson, and in 1914 became manager of the company. He was elected president last year.

A recognized authority on machine tool design and shop management, Mr. Flanders is also the author of a book, *Gear Cutting Machinery*, as well as of several papers presented before the A.S.M.E. In the latter organization he has been active since 1908, serving on numerous committees, manager from 1926 to 1929, elected a vice president in 1929. He is a director of the Social Science Research council, a member of Secretary of Commerce Roper's business advisory and planning council, has served on the industrial advisory board of NRA, is a past president of the National Machine Tool Builders' association, and possessor of degrees from Dartmouth, Stevens Institute of Technology, Middlebury university, and Brooklyn Polytechnic institute.

Mr. Flanders this week will be awarded the Worcester Reed Warner gold medal of the A.S.M.E. for his "contributions to the better understanding of the relationships of the engineer to economic problems and social trends."

□ □ □

Howard U. Herrick, formerly president of the V. & O. Press Co., of Hudson, N. Y., on Dec. 1 became vice president of the E. W. Bliss Co., of Brooklyn, N. Y., and Toledo, O.

□ □ □

Louis C. Reis, president and general manager of the Minnesota Steel Co., Duluth, for 35 years active in the steel industry and for 16 of them with subsidiaries of the United States Steel Corp., has resigned, effective Dec. 31, on account of ill health. For the past year he has been in Pasadena, Calif. Born in New Castle, Pa., he comes from a family of steelmakers, several brothers being well known in the industry.

□ □ □

F. S. White, formerly with Allegheny Steel Co., Brackenridge, Pa., has been appointed purchasing agent of the Edward G. Budd Mfg. Co., Philadelphia, succeeding Daniel Kady.

□ □ □

Lee J. Workum assumed charge of the iron and steel scrap department of Hickman, Williams & Co. Inc., at its Cincinnati office, Dec. 1. The Portsmouth, O., operations of the L. J. Workum Co. will continue under his direction.

□ □ □

Thomas T. Watson, who joined the metallurgical department of Lukens Steel Co., Coatesville, Pa., in August, 1931, has been appointed development and service metallurgist. He will be engaged principally in service and sales work in connection with Lukens nickel-clad steel.

Mr. Watson was born in Scotland 35 years ago and graduated in 1923 from the Royal Technical college in Glasgow with the degree of Associate of the R. T. C. Until 1925 he was assistant metallurgist at David Colville & Sons. He then became metallurgist at the Cyde Alloy Steel Co., serving there for two years under Dr. A. McCance, managing director.

Thomas T. Watson

From 1927 to 1930 was assistant metallurgist at Dorman Long & Co., one of the largest iron and steel

manufacturers in England. He came to this country in 1930 and engaged as a consulting metallurgist in New York until he joined the Lukens organization in 1931.

□ □ □

George R. Sheldon, mining engineer, has been appointed assistant manager in charge of operations at the properties in Zacatecas, Mexico, of Carnegie Metals Co., Pittsburgh.

□ □ □

P. R. Clipp has been made purchasing agent of the Roberts & Mander Stove Co., Philadelphia, succeeding the late W. E. Stephens, secretary and treasurer.

□ □ □

Harlow Bradley, manager of the Paris office of Allis-Chalmers Mfg. Co., Milwaukee, is spending some time at the general offices of the company in Milwaukee.

□ □ □

W. F. Haggman, Syracuse, N. Y., has been appointed sales representative in eastern New York for Steelblast Abrasives Co., Cleveland, succeeding Charles Meyn, who died recently.

□ □ □

Raymond J. Koch, recently secretary and treasurer of Felt & Tarrant Mfg. Co., Chicago, maker of calculating machinery, has been made president, succeeding the late William F. Babcock.

□ □ □

John A. Voland, formerly secretary and assistant manager of the Golden Anderson Valve Specialty Co., Pittsburgh, has been elected president and general manager of the company, succeeding the late C. E. Golden.

□ □ □

H. B. Rost has joined the sales forces of the Cincinnati office of the Semet-Solvay Co., after being associated six years with Eaton, Rhodes & Co. Previously he was with the Hamilton Coke & Iron Co. for 11 years.

□ □ □

Thomas B. Little has been appointed active managing director of the Association of Iron and Steel Electrical Engineers, by recent action of the board of directors, succeeding John F. Kelly, who died Nov. 16.

□ □ □

N. P. Norkin, director of scientific research, Institute of Ore Dressing, Mechanger, Leningrad, U. S. S. R., accompanied by M. J. Silberand and J. E. Ketko, representing the Russian government and Amtorg Trading Corp., spent several days in the Birmingham, Ala., district last week investigating methods of ore mining. Purchase of machinery in United States is contemplated.

□ □ □

Erik V. Enevik has been made vice president in charge of the hot-rolled department, Uddeholm Co. of America Inc., New York. He was with the Braeburn Steel Co., New Kensington, Pa., for five years previous to joining the Uddeholm organization. He fills the position left vacant by G. Lofberg who has become general manager in New York for S. K. F. Industries.

□ □ □

J. D. Berg has been elected chairman of the board and V. B. Edwards has been elected president of the Dravo Corp., Pittsburgh. These offices had been occupied by the late Ralph M. Dravo, who died in Pittsburgh recently.

A. W. Dunn has been elected executive vice president.

J. S. Miller has been elected president of the Dravo Contracting Co., Pittsburgh, and W. K. Fitch has been named president of the Dravo-Doyle Co., Pittsburgh.

□ □ □

David M. Curry has been appointed to the development and research staff of the International Nickel Co. Inc., New York, to be active in development work in the nonferrous casting field. For the next six weeks his headquarters will be in Detroit. He was associated with the Ford Motor Co. for 11 years as assistant superintendent of foundry departments and later was in charge of all foundry activities of the Federal Mogul Corp., Detroit. In recent years he has carried on an extensive consulting practice.

Died:

CHARLES O. BARTLETT, 85, who with K. F. Snow in 1885 founded the C. O. Barlett & Snow Co., Cleveland, manufacturer of heavy machinery, foundry equipment and other products, at his home in Brecksville, O., near Cleveland, Nov. 28. Born in Strongsville, O., he was mechanically minded and while a young man operated several mills before founding the machinery company. He was president of Barlett & Snow until 1922. Mr. Snow died in 1932. Mr. Bartlett was active in the National Metal Trades association for a number of years, serving in 1918 as president of the Cleveland branch of this organization.

□ □ □

J. H. S. Dickenson, Sheffield, England, metallurgist-in-chief of the English Steel Corp., former president of the Sheffield Metallurgical association, and noted for research into "creep," Nov. 16. He was 52.

□ □ □

George W. French, 76, one of the early founders of the steel castings and car wheel industries of the Tri-Cities district, and an outstanding industrial figure in Iowa, in Davenport, Iowa, Nov. 27.

□ □ □

Harry W. Lowe, former special agent for the American Bridge Co., since retired, in Pittsburgh, Nov. 29.

□ □ □

Charles H. Allyn, 76, vice-president of the Madison Plow Co., Madison, Wis., manufacturing agricultural implements, Nov. 21 after a long illness. With Jackson Reuter he organized the company in 1910, shortly afterward also taking over the implement lines of the Fuller & Johnson Co., Madison.

□ □ □

Robert M. Catlin, 81, retired mining engineer and for 24 years general supervisor of the New Jersey Zinc Co., at his home in Oakland, Calif., Nov. 22. Born in Burlington, Vt., from 1895 to 1906 he managed gold mining operations in the Transvaal, South Africa.

□ □ □

J. M. Dudley, 65, secretary-treasurer of the Dudley Bar Co., in Birmingham, Ala. He was connected with the Dudley company since its organization 12 years ago. Prior to that time he was with Tennessee Coal, Iron & Railroad Co.

Here and There In Industry

YORK ICE MACHINERY CORP., York, Pa., assembled its twenty-five year club in special session at its home offices recently, the full membership of 281 members being present, to celebrate the coming to York in 1897 of the late Thomas Shipley, brother of William S. Shipley, present president of the corporation. The latter presided, inducted the new members, and presented membership pins to the various service groups.

The club represents 20 per cent of the men on the payroll 25 years ago and years of service total 7990. Individual service records range from 25 to 46 years. Three men who came to York with Thomas Shipley in 1897 are holding responsible positions in the staff.

Records for the longest unbroken term of continuous service go to William H. Troutman, Charles E. Gross and Frank Schlosser, each of whom has been on the payroll 46 years, having started in 1888.

□ □ □

Johnson Steel & Wire Co., Worcester, Mass., has bought a building and acreage at Cuyahoga Falls, O., and will build additional plant facilities and start production early in

1935 of steel wire. J. H. Paterson, South Bend, Ind., is general manager of the plant.

□ □ □

Oster-Williams, Cleveland, manufacturer of pipe and bolt threading equipment, has opened an office and display room at 292 Lafayette building, New York, H. B. Van Osten, district manager. The display will include one each of practically every type of machine and tool produced by the company.

□ □ □

Hermanson, Nortman Co., Milwaukee, formed recently to specialize in rustproofing metals for manufacturers without such facilities, will operate under license from the Parker Rust-Proof Co., Detroit. A shop has been equipped at 401 South Seventh street, in charge of Sune Hermanson.

□ □ □

Kelvinator Corp., Detroit, manufacturer of refrigerating devices, increased its sales 34 per cent in dollar volume during its fiscal year, just closed, over the previous year and 42 per cent over those of 1932.

Urges Steelmakers To Design Frames for Low-Cost Houses

A MACEDONIAN cry to the steel industry to turn its back on orthodox designs of structural members and bring out a modern lightweight steel framework for low-cost housing is being uttered by John J. Earley, an architectural sculptor of Washington and Rosslyn, Va.

Present-day representative of a family that for generations has been conspicuous in decorating the interiors of churches and public buildings, working especially in concrete, Mr. Earley visualizes a new industry —that of housing—springing up under government stimulus and leading the nation out of depression.

Mr. Earley would apply to the design and erection of homes the same skill and economy devoted to the design and erection of skyscrapers. Departing radically from housing orthodoxy, he looks to men in the steel industry who are flexible, who in automobile bodies and frames have conformed to radical annual changes, to take the lead.

According to Mr. Earley, there are three price classifications in which low-cost housing can be achieved rapidly. One is from $3500 down, for workers of modest or lean means; the second is from $3500 to $5000, for individual owners who might be termed middle class; the third is from $6000 to $9000, for persons who are coming down from large properties as they have from high-price to low-price automobiles during the depression. These prices all are exclusive of the site.

What steel must do is to provide a framework, largely pre-fabricated, which can be welded on the site. This framework must be sheets or strip pressed and welded in the mills. Even the lightest standard structural section now rolled is too heavy.

For the $3500 and less house, Mr. Earley draws up these specifications:

Foundation to be a concrete slab, reinforced with mesh, on six inches of cinders for insulation. This slab would be comparable to a section of concrete highway. There would be no basement.

The house would be one story, having a cubical content of 10,000 to 11,000 feet. Walls would be pre-fabricated concrete sections 2 inches thick, reinforced with 4 x 4-inch No. 0 wire welded mesh. These slabs could be made any size up to 10 x 20 feet. For the average house about 24 slabs would be required. Steel casement windows and door frames would be cast in the slabs.

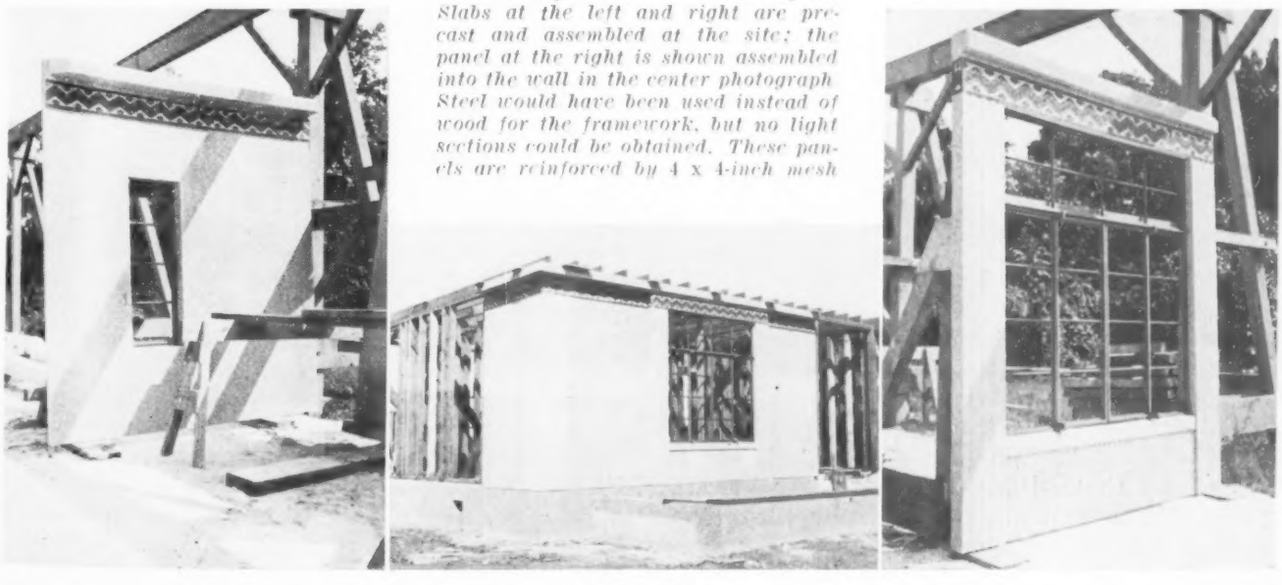
These slabs, having a compression strength of 6000 pounds to the square inch, would be attached to the light steel framework, resembling an automobile frame. To this framework would be affixed insulation and wall board. Wiring would be in the baseboard, with no fixtures. Bathrooms would be pre-fabricated units; partitions between bathrooms and kitchens could have piping installed at the factory.

The flat roof would be metal, composition or even concrete, and in mild weather would supplement the interior living room, three bedrooms, bath and kitchen-dining room. From Richmond south, no insulation would be necessary. The heating unit would be a diminutive hot air furnace with a blower.

For such a house two to three tons of steel would be required. For the slabs enclosing the house 2000 square feet of mesh would be required, which is included in this total.

In his studio at Rosslyn, a suburb of Washington, Mr. Earley is set up to turn out slabs for such a house at the rate of one house a day, with possibilities of expanding indefinitely. Panels for such a house could be erected in two days and the structure made habitable in 30 days.

Several important steel manufacturers are co-operating with Mr. Earley in developing his plans.



An Earley pre-fabricated concrete house being erected in Washington. Slabs at the left and right are pre-cast and assembled at the site; the panel at the right is shown assembled into the wall in the center photograph. Steel would have been used instead of wood for the framework, but no light sections could be obtained. These panels are reinforced by 4 x 4-inch mesh

EDITORIAL

Get in on Ground Floor Today; Tomorrow May Be Too Late!

DECEMBER is the month when forward looking executives of industry put the finishing touches upon their plans for the new year. It is the time for weighing values carefully and for refocusing effort upon worthwhile objectives.

Heads of companies who are alert to the significance of current developments in industry will realize that planning for 1935 calls for a decidedly different treatment than was accorded the plans for the past several years. In preparing for 1932 and 1933, management was actuated by motives of conserving assets and of holding down expenditures. An attitude of negation dominated the job of planning. A year ago, when looking forward to 1934, executives, while encouraged by the mounting evidence that the worst of the depression was behind them, still were influenced by the uncertainties of the period to continue pursuing a policy of restraint.

Today management is justified in approaching the new year in a more constructive frame of mind. This time the annual task of charting the course for the next 12 months can be assumed with a more positive conviction that less attention need be devoted to house cleaning and that more emphasis should be placed upon problems of rebuilding soundly for the long term future. It is time to shift the focus of executive thinking. Whereas for several years it has been concentrated upon the vexing problems of the moment, today it may be pointed more directly to the consideration of factors which will influence the development of one's company in the next few years. In brief, executives can drop the "get by" technic of recent years and can safely substitute for it a philosophy of reconstruction.

Economic Conditions Now More Favorable to Success of Next Drive for Recovery

This change in tactics can be justified on two counts. First is the undeniable fact that throughout the industrial nations of the world the tide toward recovery, which set in during the last half of 1932, has gained strength with each successive surge. Even in the United States, where the gains from three waves of recovery effort have not been held as consistently as in the other principal industrial countries, present signs indicate that the fourth wave which started in September will advance in more orderly fashion.

The second and the more specific count from the standpoint of companies in the iron, steel and metalworking industries is that during the present period materials, products and methods are under trial and that the possibility now offered of winning acceptance of one's goods or services constitutes the richest opportunity that has confronted industry in many years.

Everyone remembers that in normal times prior to the depression certain established alignments between manufacturers and suppliers of materials and parts were important factors in the placing of sub-contracts on large awards. For example, when a company received a contract for locomotives, cars, a car dumper, a rolling mill, or similar equipment, the orders for steel, castings, forgings, bearings, lubricating devices, electrical equipment and other purchased materials or parts usually went automatically to the suppliers of these products who for the most part had collaborated with the major contractor on previous awards.

Materials and Parts Now Are on Trial; Later New Alignments Will Be Formed

Today practically every one of the old alignments has been destroyed. We have witnessed the placing of contracts for railroad trains with companies which previously had not built a railroad car or locomotive. Many of the parts of these trains are supplied by companies new to the railroad equipment field. Examples of this trend away from long established alignments could be cited in many branches of industry.

The explanation is that so many new materials, parts and methods are available for the use of designers and engineers that the present interim between periods of sustained activity is being utilized to test goods and services, to experiment with new applications, and to gather experience which will help in the selection of the proper materials or parts for future production schedules.

See that your product is given a trial now when conditions are favorable. Make sure that the manufacturers of every type of equipment in which your materials, parts or services can be used are familiar with the merit of what you have to offer.

Today, when you are planning for 1935, is the time to grasp this unprecedented opportunity. Tomorrow, when production schedules are established and when relations between equipment builders and suppliers have become crystallized into new, enduring alignments, may be too late.

Now is the time to get in on the ground floor.

THE BUSINESS TREND

Positive Gains in Business Usher in Twelfth Month

ANOTHER week has furnished evidence of a satisfactory continuance of the mildly upward trend in industrial activity which has prevailed in uncertain degree since the latter part of September. The only change worth noting is that the tone of improvement now is much more positive than it was several weeks ago.

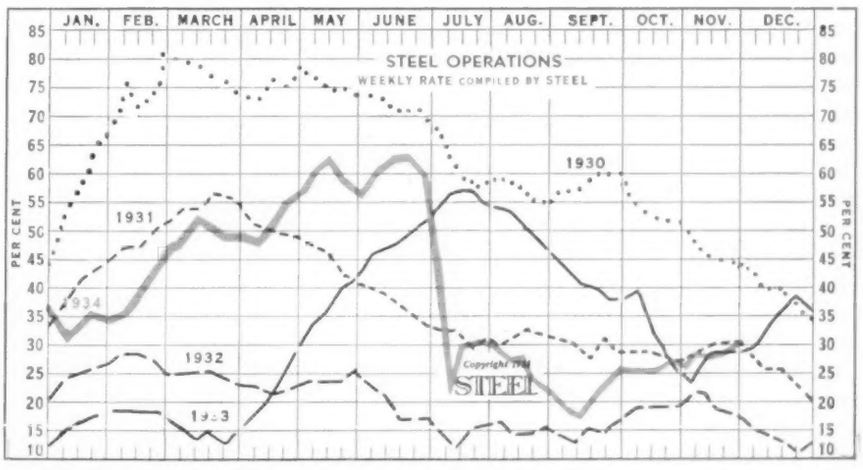
Of the four outstanding weekly indicators, electric power output is making the most impressive showing. Production for the week ending Nov. 24 totaled 1,705,413,000 kilowatt hours and topped every weekly figure since January, 1931. Electric power output now is exceeding the volume of the average of pre-depression years and is only slightly below the peaks of 1928 and 1929.

Revenue freight car loadings are holding up remarkably well at a time when seasonal influences call for a moderate recession. Assemblies of automobiles continue at low ebb. At the beginning of November, plants in the United States were assembling about 17,000 cars per week. At the close of the month the rate had declined to about 13,000 weekly. The imminence of production on new models will bring an upward surge in assemblies at an early date.

Meanwhile the rate of steelworks operations has mounted steadily until at the end of the eleventh month it was within striking distance of 30 per cent. While the gains from the low point of the autumn have been due principally to demand from miscellaneous consuming groups, from now on the influence of the reviving activity in the automobile industry will be a strong factor.

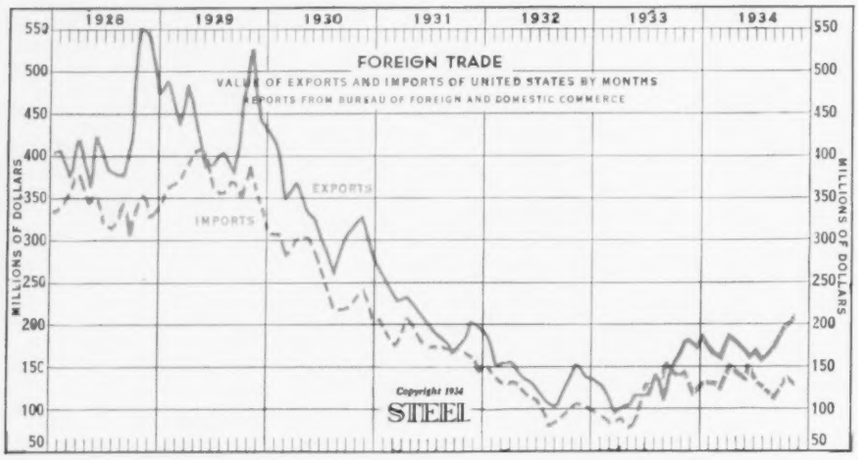
Turning Point Was Passed in September Monthly Record for October Confirms Belief

Most of the late monthly statistics show favorable reports for October. Noticeable among these were a marked improvement in building construction, another upward lift in foreign trade, a gain of from 73.9 in September to 77.0 in the index of industrial employment, and slight increases in orders and production of several industrial materials and items of equipment. Prices in most cases have held steady, although steelmaking scrap—a sensitive commodity—advanced sharply in November.



1934 Per Cent	
Nov. 24	29
Nov. 17	28
Nov. 10	27.5
Nov. 3	27
Oct. 27	25.5

1933 Per Cent	
Nov. 25	28.5
Nov. 18	28
Nov. 11	24
Nov. 4	25
Oct. 28	30



Exports	
October, 1934	$206,352,000
September, 1934	191,690,000
October, 1933	193,069,000

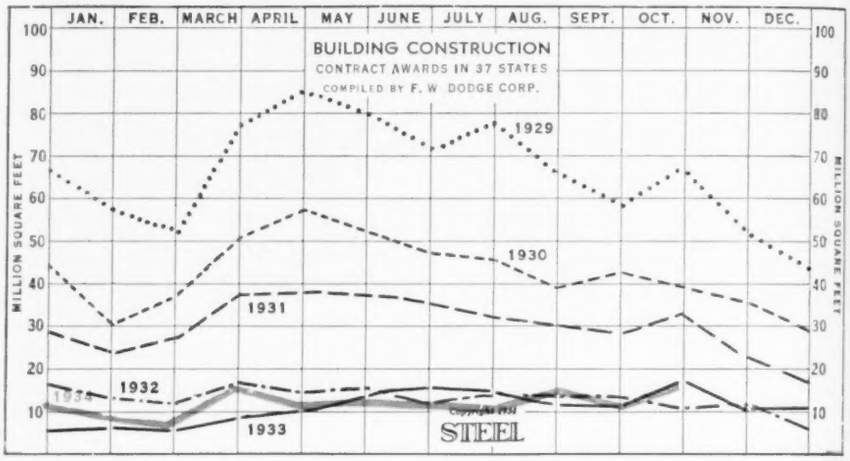
Imports	
October, 1934	$129,629,000
September, 1934	131,659,000
October, 1933	150,867,000

October Merchandise Exports Highest Since April, 1931

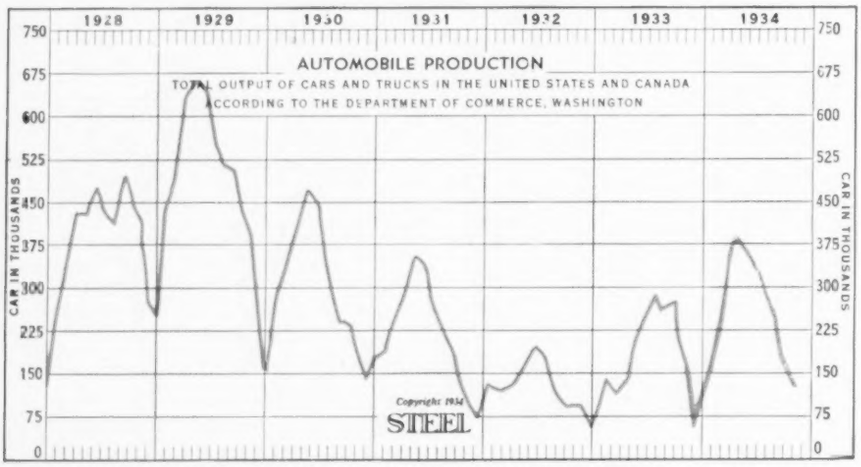
Merchandise exports during October totaled $206,352,000, the highest valuation for any month since April, 1931. This is a sharp increase over the preceding month when exports totaled $191,690,000 and compares with $193,069,000 in October a year ago. Imports during the month were $129,629,000 a slight drop from the $131,659,000 in September and considerably below the $150,867,000 in October, 1933. This increased foreign trade gave the United States a favorable trade balance of $76,723,000 for October.

Building Awards Show Moderate Improvement

Building awards as measured in new floor space in 37 eastern states advanced nearly three million square feet in October. The latest report from F. W. Dodge Corp., places awards for the tenth month at 15,098,100 square feet, the highest this trend has reached since October, a year ago, when awards totaled 15,534,700 square feet. Awards for the first ten months of this year total 130,442,500 square feet and compare with 123,840,100 in the corresponding period of 1933.



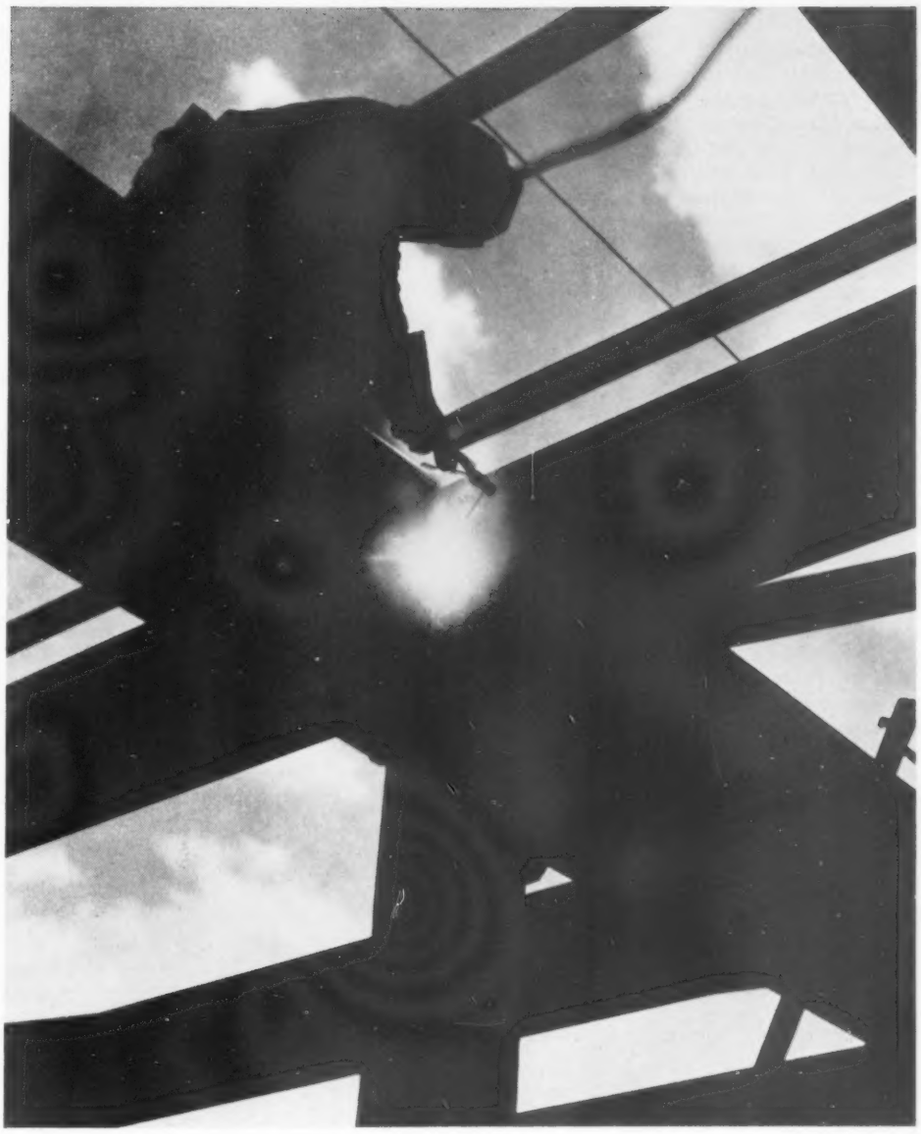
Square Feet	
October, 1934	15,098,100
September, 1934	12,510,300
October, 1933	15,534,700



October, 1934	136,268
September, 1934	174,451
October, 1933	138,638

Automobile Output Continues Seasonal Decline

Automobile production in the United States and Canada continued its seasonal downward trend during October. Total production during the month was 136,268 units, of which 3780 were produced in Canada. In the preceding month output stood at 174,451 units while in October, 1933, production totaled 138,365 units. In the first ten months of this year production aggregating 2,629,545 units, far exceeds the 1,839,180 produced in the corresponding period of 1933.



A NEW STAR IN THE SKY

ARC welding, a comparatively new tool in the hands of the structural steel erector, provides quick, quiet means for joining beams and columns into a single strong unit. Here is an interesting study in lights and shadows of a nimble welder at work on a plant addition of the Lincoln Electric Co., Cleveland.

Refinements in Operation of Chipping

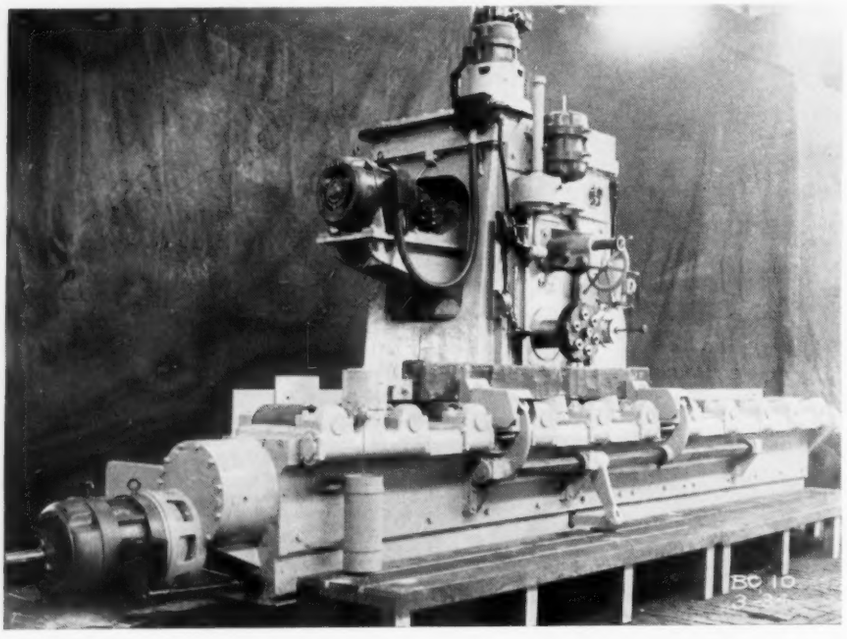
AS A RESULT of improvements developed early this year by the Bonnot Co., Canton, O., in its "billeteer" machine, now in use in several large steel plants, billets for the manufacture of seamless tubes are being cleaned at a total cost varying from 40 to 60 cents per net ton. These machines remove surface defects such as pipes, seams and scabs, the cost varying within the above range according to the original surface condition of the billets. Cleaning is done by high-speed steel cutting tools mounted in a milling-type head, at a tool cost ranging from 1 cent per ton for ordinary mild steel up to 2½ cents for tough alloy steels. The machine has capacity for cleaning billets in any size up to 14-inch square.

Handle Controls Three Motors

In speeding up the machine the principal factor is the development of a new finger-tip control. This is a handle mounted in a ball socket and provided with eight contactors by means of which it controls three motors, one moving the carriage longitudinally, one revolving the cutting head and one raising and lowering the cutting head. None of these motors can operate while the handle is in the "off" position, that is, when it is pressed back in the socket. This is a safety factor of great value, since the operator can stop all movements on the machine instantly by simply pushing the knob in to the off position.

For operation, the knob is pulled out and the various motions are obtained by moving the knob in the direction of travel wanted. Raising the knob raises the tool head; lowering the knob lowers it. When the knob is moved to the left, the carriage moves to the left. When it is moved to the right the carriage moves to the right. When the knob is out full length, the head revolves. When the knob is depressed 1 inch, the tool head stops rotating, but the use of all other movements still is available.

This is considered to be one of the fastest controls ever developed for such use. The elevating motor which elevates the tool head is stopped and started as often as 40 times a minute. The motor which drives the carriage is started and stopped 25 to 35 times per minute. As a result of this speedy control, it is stated, the cutting tool can be placed over chalk lines on a billet approximately five times as quickly as a manually-operated air gun can be placed from one chalk line to another. It is the development of this quick, flexible control together with the power behind it which has made it possible to get billet cleaning results at such low costs.



General view of the billet chipping machine, showing billet mounted in position. The finger-tip control knob may be seen in the operating position

How Billet Is Handled

The machine operates in the following manner: A billet is loaded on an ordinary skid and fed into the machine from the left. It is gripped from the side in collapsible vise-type chucks. The billet remains stationary while cutting. With the tool head set in the proper position for cutting, the top surface of the billet is cleaned by moving the cutting head to the desired direction. The carriage then is returned to the starting point, the chuck is opened, the manipulating hook turns the billet. The billet then is re-chucked and the new surface is cleaned and this sequence followed until the entire billet has been gone over. Approximate time for turning and rechucking is from 3 to 5 seconds. When the billet has been cleaned on all four sides it is rolled out at the right end of the machine and another enters at the left, thereby eliminating any time loss due to handling. The work is at all times in full view of the operator and he is in a position to inspect it while the tool head is in motion.

The operating principle of the billeteer is a longitudinal travel of the main carriage, the base and billet remaining stationary during the cutting. The inner cage, in which the tool head revolves, has a vertical travel of 14 inches. The cutting head and arbor have a lateral movement of 14 inches. The latter movement is accomplished manually by means of a pilot wheel. The head revolves at 6 2/3 revolutions per minute. By

Control Speed New Billet Machine

means of the finger-tip control mentioned above, the tool head can be raised, lowered or moved forward, backward or laterally while in motion between tool cuts. The design of the control so that all movements are obtained by moving the control handle in the direction of travel greatly facilitates the operation of the machine.

Above the control switch are two drum switches. One of these controls the operation of the chuck and roll table, while the other controls the manipulator and also acts as a safety switch for the entire machine.

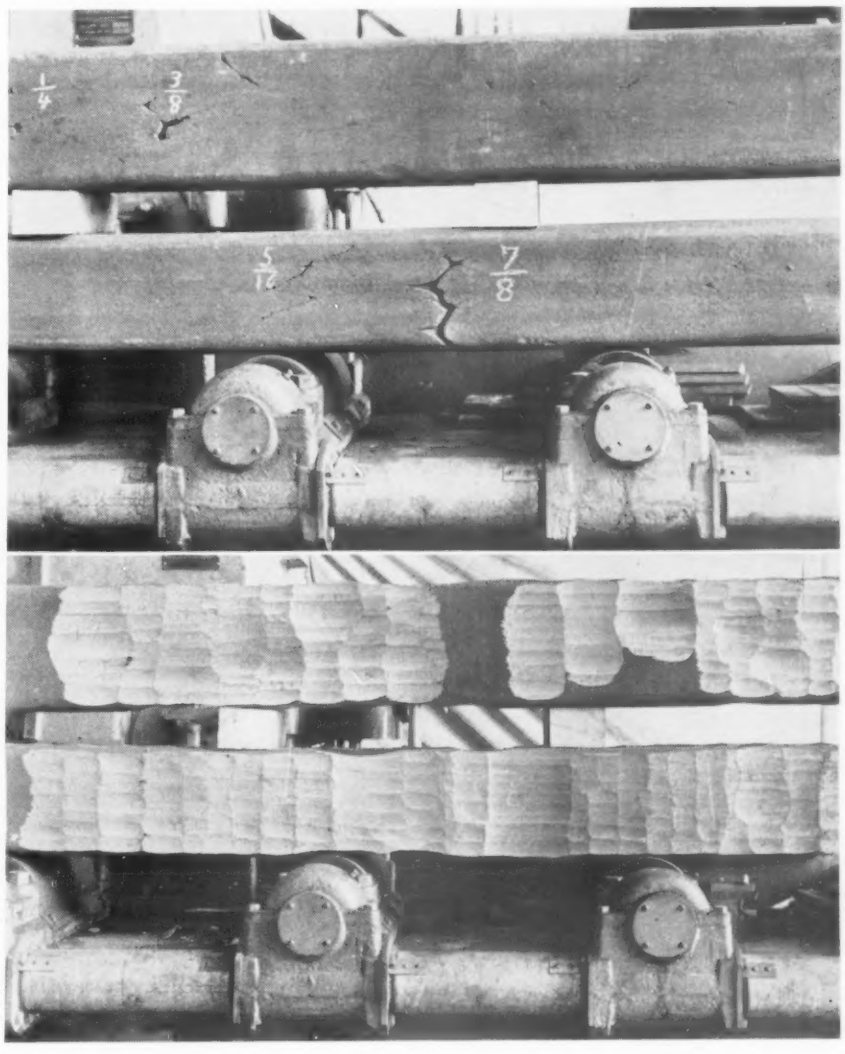
Numerous Safety Features

Interlocking safety features are as follows: The manipulator hook can be operated only when it is in the correct position between rolls; a red light indicates these positions. While the manipulator hook is operating the carriage cannot be moved in either direction. The main operating handle on the control also acts as a safety for all power lines on the machine. All power and control circuits on the entire machine also may be cut by pushing to the right the handle on the top drum switch. A portable control panel is mounted under the tool head motor at the left on the carriage; this panel controls the tool drive, manipulator and tool elevating mechanism motors.

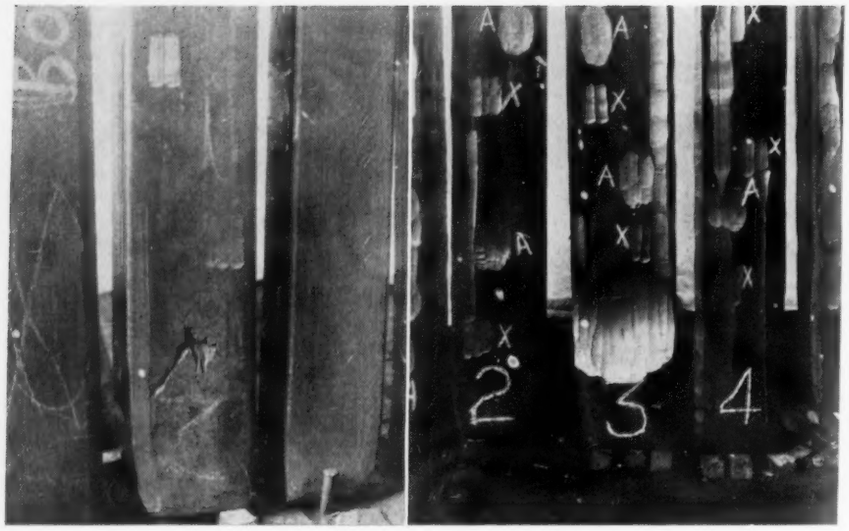
Six motors are required for operating the machine. A 25-horsepower motor furnishes the longitudinal movement of the carriage. A 20-horsepower motor revolves the cutting tool head; this is the only nonreversible motor on the entire machine; it is nonreversible for the reason that the cutting is only in one direction, against the billet stop. A 7½-horsepower motor raises and lowers the inner cage containing the tool head. A 7½-horsepower motor operates the manipulator for turning the billet on the roll table. A 10-horsepower motor drives the roll table rolls for moving the billets in and out of machine. A 7½-horsepower motor operates chucks for chucking and unchucking the billets.

The revolving movement of the tool head is through herringbone gear and pinion and a large worm gear which drives the arbor on which the cutting head is mounted. The gears are steel. The worm is S. A. E. 6150 steel, treated for hardness and ground. Longitudinal movement of the carriage is through a lead screw driven by herringbone gear and pinion, with the pinion mounted on the motor shaft. Raising and lowering of the cage containing the tool head is by means of two screws, each 2½ inches in diameter, driven through gear and pinion drive, and engaging large flanged bronze nuts. The manipulator is driven through a screw. Roll table rolls are geared to a worm drive shaft which revolves all the rolls simultaneously in either direction.

The chucking device is operated by actuating the chuck jaws in and out. The tool head arbor is keyed into



Above are shown two 7 by 9-inch scrap nickel-molybdenum steel billets, as-rolled. Below are the same two billets, in the same position, after being machined

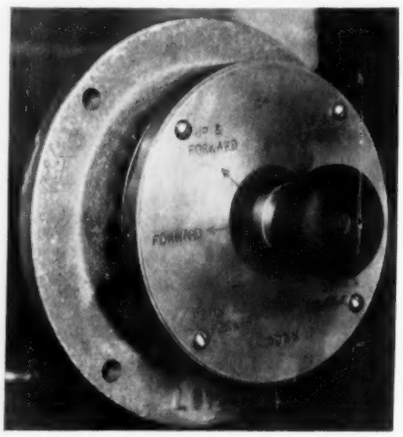


Another "before and after" illustration, showing (left) three billets with defects and (right) the same billets after machining. In removing the bad defect in the center billet, a 10-inch cut was required, 8 inches wide and 1⅛ inches deep in the center. The cut was made in two minutes

a hardened and ground steel sleeve which rotates in close-grained gray iron bushings. All gears and bearings run in oil. The entire machine is equipped with tapered roller bearings, with the exception of the roll table rolls which are placed in bronze bushings. These also operate in oil. The machine is provided with a pressure lubricating system with lubricating points conveniently located.

Six high-speed steel cutting tools, each 2 inches wide, comprise the cutting equipment. They are ground at the cutting ends as required, means being provided for adjusting the shortened tools in the tool head. Cutting capacity of the machine is approximately 150 square inches per minute. The cutting action is such, it is stated, that the seams are not covered up but, if not removed entirely by the first cut, become more visible. If desired, the head may be set in a stationary position and a planer cut taken with any one of the six tools, set at the desired rake. Cuts run up to ½-inch on soft steel.

The machines are of rugged construction. They weigh 32 tons and take floor space of 10 x 28 feet.



Master finger-tip control station, showing handle in the "off" position. For operation it is pulled out about 6 inches

Each is self-contained and can be set up on a foundation and wired within a few hours' time. The original billeteer was built and installed 5 years ago and has the unique record of having performed on 24-hour runs during much of its life with no lost time due to breakage or failure of parts.

Only Surface Scratched In Standardization

Industrial Standardization, Its Principles and Application, by John Gaillard; cloth, 123 pages; published by H. W. Wilson Co., New York; supplied by STEEL, Cleveland for $2, plus 15 cents postage; in Europe by the Penton Publishing Co. Ltd., Caxton House, London.

Evidence collected by the author tends to show that the degree to which industrial standardization has been adopted by manufacturing establishments in the United States as a systematically applied managerial function represents only a small fraction of what might be expected in view of the benefit which may be derived from its application.

The discussion presents valuable information on the four major phases in which standardization work may be carried out, namely, within the company, by trade association or technical society, under the procedure of a national standardizing body, or, if desired, on an international scale.

In a historical sketch covering the evolution of standardization, in which type of standards and the human factors entering into the consideration are outlined, the author presents studies on essential functions of industrial standardization, a definition and characteristics of a standard, normal values and limits, development of the practical application of standardization work. A chapter dealing with the standardization of a manufacturing concern stresses the problem of co-ordinating different activities which permit the formulation of certain principles to be observed in organization and in carrying out industrial standardization in practice.

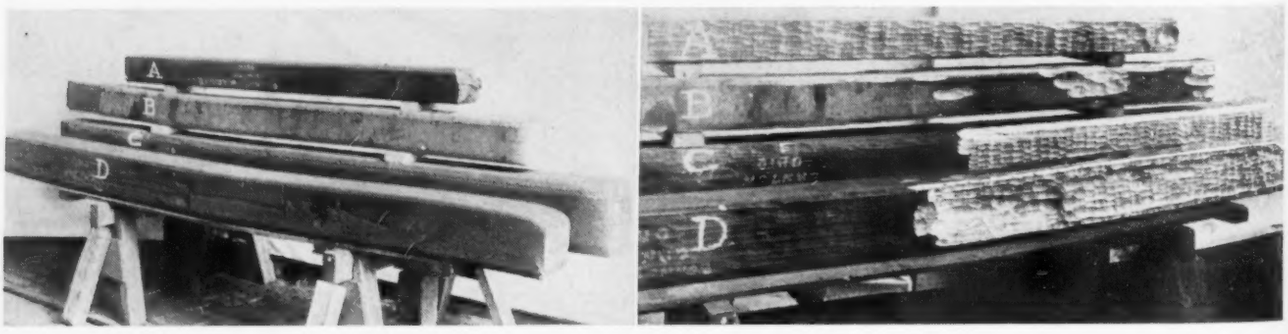


Illustration at the left shows four billets; A is stainless steel; B is screw stock; C and D are S.A.E. 3140 steel. Billets C and D were chipped halfway by the airgun method and the opposite ends were chipped by the billeteer. At the right are the same four billets, completely finished by the machine method

Will Roll Wide Aluminum Plates for Tank Cars

While sheet steel manufacturers are talking of the possibility of producing flat-rolled steel above the present practical widths of around 85 inches, the Aluminum Co. of America is preparing to make use of flat-rolled aluminum in 140-inch widths for the manufacture of the tank sections for railroad tank cars.

It is planned to weld the tank out of two plate sections, each around 32 feet long and approximately 140 inches wide by 7/16-inch thick. A camber of ⅛-inch at approximately the center of the 140-inch aluminum sheet is apparently the only de ation from gage. This allowance appears to be permissible in view of the desire of tank car builders to have a slight flare close to the center of the railroad tank car. Formerly, aluminum tank cars had been constructed in standard dimensions by the use of five plate sections riveted latitudinally. Now there is a possibility that they will be made out of two longitudinally-welded plate sections.

\$ \$ \$

Blast Cleaning Machine Employs New Principle

A manufacturer of blast cleaning apparatus has developed a new unit in which the abrasive is fed into an air stream from a high-pressure fan blower, the wheel of which is mounted direct on the shaft of a ball-bearing motor. The kinetic energy of the blast is imparted to the abrasive grains. The manufacturer, the W. W. Sly Mfg. Co., Cleveland, states that this new blast principle makes it possible to multiply the number of abrasive grains that can be used with a resulting proportionate increase in the number of impacts upon the surface to be cleaned. Formerly compressed air was used as the abrasive carrier in this unit.

\$ \$ \$

Chrome-Moly Steel Used In Incinerator Parts

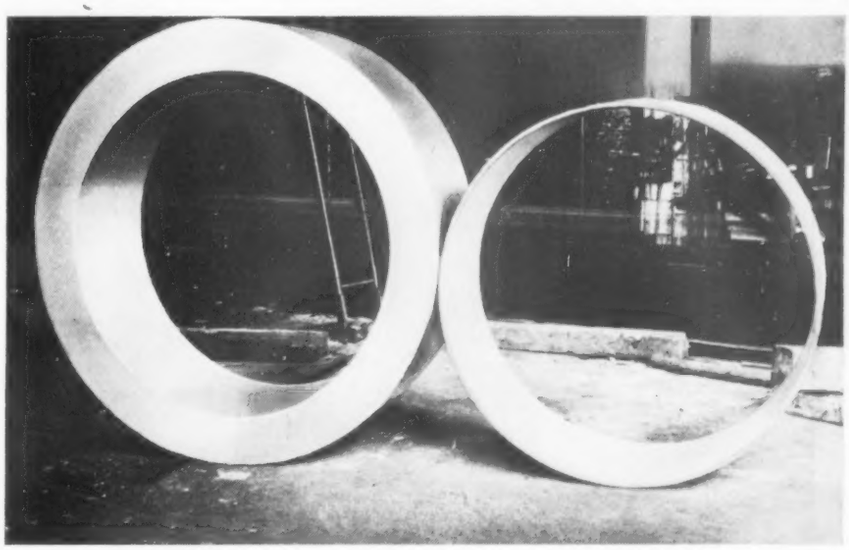
A number of commercial tests show that steel castings and tubes having a chromium content of 4 to 8 per cent, with or without modifying elements such as molybdenum, tungsten or titanium, give excellent results when used for various parts of municipal incinerators. Tubes of this composition are used for the preheaters while castings are used for a number of parts which are subjected to considerable shock and relatively high temperatures. The results obtained have been so satisfactory that steel of this analysis is specified by the city of New York for a large number of its incinerator parts.

\$ \$ \$

Preheating Speeds Output

In manufacturing air cleaners for tractors in which a bronze casting is welded to a sheet iron cylinder by means of the oxyacetylene process, a Minnesota sheet metal plant has been able to speed up this produc-

Resists Abrasion



ORE CRUSHER ROLL SHELLS HAVE LONG LIFE: A new and an old roll shell, cast by the Columbia Steel Co., San Francisco, and used in ore crushers by a western copper mining company. The new shell, at the left, is 78 inches in diameter, 24 inches wide and 9 inches thick. The ring at the right has just been removed from service after crushing a total of 300,877 tons of ore; it is worn down to 1½ inches in thickness. Cast steel used in these shells is a high-carbon nickel-chromium composition, normalized and tempered to a brinell hardness of about 300.
Photo courtesy Nickel Steel Topics

tion by preheating the bronze casting.

s s s

Rest, Ride, Sleep On Steel Springs

CONSTRUCTION of the average spring upholstered davenport requires 200 feet of No. 10 wire for the back and 260 feet of No. 14 wire for the seat. This means an average of 9.8 pounds for the back and 4.4 pounds for the seat or a total of 14.2 pounds. The average upholstered chair requires 5 pounds of spring wire in the same proportions as the davenport.

Consumption of spring wire in the manufacture of the new type of spring filled mattresses varies in accordance with the design and size of the mattress. A mattress which is regarded as representative of the average requires about 600 feet of No. 14 gage wire which means about 10.2 pounds. The most expensive mattresses of this type uses as much as 2000 feet of wire or about 34 pounds. One large manufacturer of assembled spring units states that it is making 7000 to 8000 spring units per day for a mattress manufacturer thus indicating the importance of this outlet.

Requirements of spring wire for bed springs vary in accordance with the design. The average typical double bed spring contains 34 pounds of wire including the coils. The wire coils are made of Nos. 11 or 12 gage spring wire and are held in position by cross helical springs. The outside coils are fastened to border wire and the construction is strengthened by interweaving lengths of cross tie wire halfway between the top and bottom of the coils. The border wire is No. 0 and the cross tie wire is No. 14. Most designs are quite similar to this, varying largely in the method of supporting the coils.

Production Varies

Less expensive types of bed springs use lighter sections. Springs for single beds are of the same length as for double but are about 15 inches narrower and the wire weighs approximately 25 pounds. Relative production of the two sizes varies with different sections of the United States. In some sections output of double bed springs is twice as great as that of singles, while in other sections the proportions are equal.

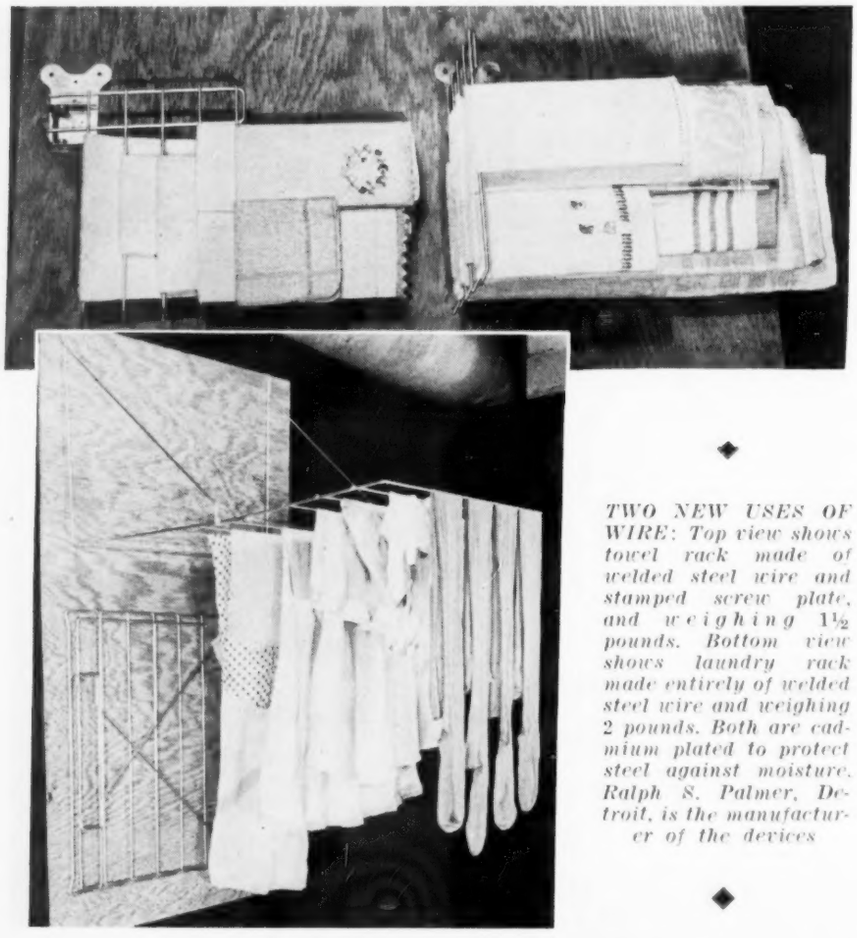
It is estimated by a prominent producer of spring wire that round spring wire consumption is approximately 200,000 to 250,000 tons a year and that 70 per cent goes into upholstered springs for furniture and automobiles and spring filled mattresses and bed springs.

Consumption of springs in upholstery for the average automobile ranges from 12 to 15 pounds which on the basis of 1934 production of automobiles (2,600,000) would mean between 15,600 and 19,500 tons.

While many grades of steel are used for making springs, the greater tonnage by far is made of plain carbon steel containing about 0.9 to 1.0 per cent carbon for the heavier wire and about 0.5 per cent carbon for smaller diameter wire.

s s s

Housewife's Friends



TWO NEW USES OF WIRE: Top view shows towel rack made of welded steel wire and stamped screw plate, and weighing 1½ pounds. Bottom view shows laundry rack made entirely of welded steel wire and weighing 2 pounds. Both are cadmium plated to protect steel against moisture. Ralph S. Palmer, Detroit, is the manufacturer of the devices

Develops New Facing To Give Smooth Castings

A facing material to provide smooth and fine-grained surfaces free from pits, pinholes, etc., on castings, and which is claimed to give excellent peeling properties is composed of 100 parts of finely ground coke mixed intimately with 30 to 40 parts of crude molasses, according to a recent patent. The molasses is sprayed on hot coke in a mixer and then dried at 110 to 120 degrees Cent. to remove moisture.

s s s

Press and Hammer Jobs Hazardous

POWER press and forge hammer jobs are dangerous, says C. A. Partenheimer, American Optical Co., Southbridge, Mass., in the November *News Letter* of National Safety Council Inc. This is especially true because goggles are not as generally prescribed for these and kindred jobs as they are for work such as chipping, riveting and grinding, etc. A chip from a power press or sparks and scale flying from a forge hammer can cause as much havoc as a chip from a steel casting. Perhaps it is because they don't fly like sparks from a comet that these jobs are not classified by some firms as especially dangerous.

A large user of punch presses recently reported an instance where goggles would have saved an eye. A punch press operator was blanking laminations out of 0.042-inch silicon steel sheet. The operation was being performed in an open die without a

stripper plate. Due to segregations of silicon the stock was exceptionally brittle. A small sharp piece of scrap thrown by the force of the punch entered his left eye causing permanent blindness of that organ.

Since that accident this man's company has compelled all press operators performing blanking operations to wear goggles. And it has gone a step farther. A survey of all operations, both machine and bench, has been made and today all operators engaged in work where flying particles of any kind are present are required to wear goggles.

No "Unavoidable Eye Losses"

Not only does this firm, but many other companies insist on the use of goggles, shields and screens in their punch press and forge departments and such firms do not have the so-called "unavoidable eye losses."

Today goggles properly selected offer the wearer not only protection but increasing comfort and ventilation as well. Right here is a good place to again remind all who are, or should be, concerned with the wearing and supplying of safety goggles, that no eye protector can give better service than it is given. By this we mean a safety goggle should be given the same care as a good tool, cleaned often, new parts supplied when necessary, adjusted to fit the wearer and replaced when it has outlived its usefulness.

Forge hammer men often object to wearing goggles on account of the lenses seating and fogging. This complaint can be lessened by applying any one of several preparations sold for this purpose, or by using soap on the lenses. Be sure the lenses are polished by a light rubbing with a clean cloth after any anti-sweat compound is used.

Another relief from fogging is the use of wire screen instead of glass. A wire screen mask of the proper mesh, well designed to cover the entire face is now in use by some operators on forge hammers.

S S S

Proper Grinding Wheels Speed Spring Production

When confronted with the problem of grinding the ends of springs used in the new front wheel suspension, a large automobile manufacturer called upon a grinding wheel manufacturer for assistance. The recommendation of the latter, based upon research and practical tests, not only produced a decided decrease in grinding costs, but greatly increased production. Nut insert type disks, 30 x 2½ x 6 inches, in 16 grit, are used on a double end disk grinder taking four springs at a time. The keen cutting life of a disk is 12,000 springs, grinding 150 per hour or 1200 per man per day, and removing 1/32-inch of stock on each end. The cost by this method amounts to 0.9-cent per spring.

Huey's Monument

CORROSION RESISTING SHEETS SERVE DUAL PURPOSE ON RAIL APPROACHES OF "HUEY P. LONG" BRIDGE: Over the wooden ties on both the east and west approaches of the Mississippi river bridge at New Orleans were placed Beth-Cu-Loy corrosion resisting steel sheets furnished by Bethlehem Steel Co. They are intended to protect the steel supporting structure from the corrosive action of brine drippings and to shield the wooden ties from live coals and sparks dropping from passing locomotives. Two tracks will be laid, a rail being installed on either side of the two insulating boxes shown

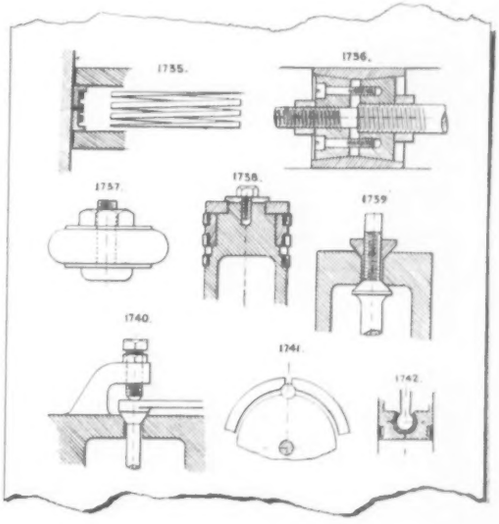
S S S

Engineering Sketches Are Arranged in Bookform

The Engineer's Sketch Book; by Thomas W. Barber; published by E. & F. N. Spon, London; distributed in this country by Engineering Book Shop, New York; supplied by STEEL for $4.50 plus 15 cents postage.

To strive for originality in designing machinery is the precept of every conscientious engineer. Yet there are times when his store of ideas becomes exhausted, in which case such a reference work as *The Engineer's Sketch Book* becomes an invaluable aid. Mr. Barber in 25 years of designing found a genuine need for this type of compilation. He endeavored to overcome the deficiency in his own practice by private notes and sketches gathered promiscuously. When the difficulty of selection and arrangement became apparent he began to classify them; hence the inception of the present volume.

Nearly 3000 sketches supplemented by brief notes make up the 355 pages of the book. Examination of a portion of a typical page on stuffing boxes, which accompanies this review, discloses the purpose which it serves. The book may well be called an idea thesaurus to which the man engaged in designing a new machine or mechanism may go to augment his plan of carrying out a



Portion of typical page from the Engineer's Sketch Book which shows stuffing box designs

certain type of movement or operation.

This is one of the few compilations wherein an attempt has been made to provide side by side suggested sketches of the various methods used for accomplishing any particular mechanical movement or work in a form easily referred to and devoid of detail and elaboration.

$ $ $

Backing-Up Bars for Pipe Welding Are Water Cooled

In the fabrication of pipe a western company has effected an interesting solution of the problem of cooling the copper backing-up bars used in the mechanical electric welding of 30-foot sections of pipe. An attempt was made to water-cool these bars by tacking or brazing copper tubes to the bars themselves but this method proved unsatisfactory. The following practice now is being followed successfully:

Bars ¾-inch thick by 2½ inches wide and 30 feet long are bought and two grooves planed out of the entire length, each groove being ½-inch wide and $\frac{5}{16}$-inch deep. A copper strip $\frac{5}{16}$-inch thick by 2¼ inches by 30 feet is tightly clamped to the grooved bar and spaced evenly thereon and welded to the copper bar. The longitudinal pipes made in this way serve for the passage of sufficient water to cool the bars adequately.

Steel Sheet Caisson Foundations Used By U. S. Lighthouse Service

SEVERAL steel sheet piling caisson type foundations for minor lights have recently been constructed in the second lighthouse district, according to the department of commerce *Lighthouse Service Bulletin* for Oct. 1.

These foundations consist essentially of interlocking steel sheet piling driven in a circular section and suitably strengthened by tierods to prevent loss of shape after the caisson has been filled. This particular type of foundation has been used to replace wooden pile foundations which had been carried away by ice or which had badly deteriorated. One group of four such structures is in Cohasset harbor, and another group of six is in Boston harbor, Mass.

Some Old Piling Used

Each group of structures was installed by contract. The Cohasset group and one structure in Boston harbor were constructed of used or second-hand piling, and the other five structures in Boston harbor were constructed of new piling. The first group had an approximate diameter of 12 feet 6 inches, and the latter about 15 feet. This difference in diameter is due to the fact that the used piling had a greater degree of swing in the interlock than the new type piling, which are now all rolled standard size, thickness, and interlock, by the various manufacturers.

The first group was driven in water ranging in depth from 5 to 8 feet, while the group with the larger diameter was driven in water from 12 to 22 feet deep at mean low water. The piling of each structure in these two groups was driven to a penetration of 12 feet. Temporary piling, together with false work and segments, to furnish a driving circle, were first set up, and the steel piling was then stuck along the circle thus afforded. No particular difficulty was experienced in fitting the closure sheet, using this method. The piling was then driven by steam hammer to proper penetration.

The tops of these structures are approximately 5 feet above mean high water. A system of tierods, 1½ inches in diameter, with turnbuckles, was then installed and securely tightened to distribute strains more evenly throughout the cylinder when the fill was made. Both the inside and outside of the caissons were coated with hot bitumastic, and the tierods and turnbuckles were covered with alternate coatings of hot pitch and asphalt membrane.

In each instance suitable fill was obtained by dredging in the immediate vicinity. This fill was carried up to a point approximately 2 feet below the top of the piling, and after settling, a reinforced concrete deck slab, 2 feet thick, was poured. Holding-down bolts for securing 18-foot towers were installed at proper locations. After the concrete deck had sufficiently hardened, the towers, which were furnished by the lighthouse service, were installed by the contractor. Steel ladder rungs were provided and bolted to the foundation, to provide access to the deck at any stage of the tide.

Foundation of new light at Bryant Point, near Cohasset, Mass., is of sheet steel piling, with fill and concrete deck and surmounted by 18-foot wooden tower carrying the light

$ $ $

Coating for Steel Resists Saponification

A new paint coating known as Plicote, has been developed in the laboratories of the Watson-Standard Co., Pittsburgh. It is intended to resist breakdown and saponification by the actions of acids and alkalis. The company states that service tests which have been in progress for more than a year indicate a remarkable resistance to chemicals on the part of the new coating material. Tanks coated with Plicote are said to have withstood the action of 50 per cent caustic solutions at elevated temperatures. Brine tanks have been coated with unusual success. Painting of concrete floors also is accomplished successfully with the new material. The company also has found this material resistant to fruit and fruit acids in the canning industry since in addition to its acid resisting properties, it is tasteless, odorless and non-toxic. In addition to these resisting properties the new paint dries into a hard tenacious film having the property of flexibility.

$ $ $

Nickel Derived Its Name From "Old Nick"

The metal which is known in all languages as nickel, according to Robert C. Stanley, president of the International Nickel Co. of Canada Ltd., in a letter to stockholders, derived its name from *kupfer-nickel*, the ancient Saxon miners' epithet for copper which was so difficult to refine on account of its nickel content that they believed it to be possessed of "Old Nick."

Selecting Proper Lubricants For Antifriction Bearings

BY O. L. Maag
Timken Roller Bearing Co.

LUBRICANTS for industrial antifriction bearing applications include the following types: Lime soap, soda soap, aluminum stearate, lead base, and mixed base greases, together with oils of various degrees of refinement ranging from the light bodied nonviscous oils to the heavy cylinder stocks. These lubricants take care of practically all types of bearings. There are, however, a number of applications which are heavily loaded or where the speeds are such that a new kind of lubricant, such as the extreme pressure type which has come to the fore during the last few years, should be used. These "alloyed lubricants" serve a definite type of service in the lubrication field just as alloy steels do in modern industry.

Extreme pressure properties may be imparted to either oils or greases and there are on the market today extreme pressure greases of practically all types, and extreme pressure oils covering the range of viscosities used for lubricating various bearings in service.

Properties of Grease Vary

Different types of greases are used in applications where such lubricants are most suitable. Lime soap greases, which are usually the least expensive to compound, have the widest use. These products, as well as those compounded with aluminum stearate, are used in units where water conditions might be encountered. They do not, however, have as high melting points as soda soap greases, and their use usually is confined to the lower temperature operating conditions.

When subjected to high operating temperatures, and as a rule with higher operating speeds, a soda soap lubricant usually is preferable. Many greases have the disadvantage that, with the higher operating temperatures encountered on higher speed units, there is a marked tendency for the lubricants to become thin. The centrifugal force created by the higher speed of the bearings has a tendency to throw out the oil from such lubricants. After cooling, a layer of heavy soap is found in the bottom of the bearing housings, the oil often having drained out through the bearing closures.

Soda soap greases generally will stand up better under high temperatures and high speed conditions than lime soap products, although it must be kept in mind that there is much in the art of compounding these lubricants to give them the desired properties in regard to stability in storage and in service. Aluminum stearate greases usually will return to their original consistency even if they are heated considerably above their melting point. This property cannot as a rule be imparted to lime or soda soap greases.

Apparently for this reason aluminum stearate greases are used extensively for airplane rocker arm units. It has been the experience of the Timken company that such greases are superior to soda soap products for this service. The usual specification calls for a grease compounded from a well refined cylinder oil of 150 to 200 seconds viscosity at 210 degrees Fahr. and aluminum stearate. It is believed that cylinder stocks of 600 to 800 seconds viscosity at 210 degrees Fahr. plus aluminum stearate should be given more consideration for use in grease lubricated rocker arms.

THE accompanying article is prepared from a paper presented before the National Association of Lubricating Grease Manufacturers in Chicago, Oct. 16-17. The author, O. L. Maag, is lubricating engineer, Timken Roller Bearing Co., Canton, O.

Circulating System Beneficial

To obtain better conditions for rocker arm bearings, a circulating oil system undoubtedly would prove highly beneficial. By circulating cooled crankcase oil very much lower bearing temperatures would result, and with lower temperatures less oxidation and breaking down of the oil would occur. It is realized that the airplane builder will hesitate to increase the weight of his engines. However, since he is today building engines of greater horse-power, thus creating more heat, it is possible that he will be required to dissipate some of the additional heat by circulating cooled oil.

Most greases of tomorrow undoubtedly will be of the extreme pressure type. Many steel mill applications which are now on antifriction bearings will operate successfully with the average greases which do not contain extreme pressure properties. However, there are a number of units on which the extreme pressure greases are necessary, due to the higher speeds and increased loads which are encountered.

In some of the applications where past experience indicates that extreme pressure greases are not necessary, they have been used without harmful effects. Therefore, to be on the safe side, the Timken company has made it a practice to recommend extreme pressure greases entirely for this service. No one knows when some operating condition is going to cause overloading, and possibly the ruin of a bearing; hence, the company feels it is good practice to recommend this additional protection for their bearings, and believes that this applies with equal force to all types of bearings.

Roll Neck Grease Requirements

The grease which is used on roll necks of steel mill applications usually should be water repellent. Good success has been reported with lime-lead soap-sulphur products, as well as with lime soap sulphurized base and lime soap-sulphur-chloride base.

Many greases used for roll neck plain bearings are compounded from heavy black oils, soaps, and various percentages of inorganic fillers, such as graphite, lime, talc, mica, zinc oxide, and the like. The inorganic fillers serve to polish the bearings, giving in a short time well run-in bearing surfaces. However, the disadvantage of these products is that they continue to wear away the bearings, with the result that replacements usually are quite high. There are numerous instances where better bearing life was obtained when extreme pressure greases free from fillers were used.

The Timken company has specified that steel mill greases for use with their bearings should carry a minimum load of 33 pounds on the Timken lubricant tester, and be of proper consistency for local operating conditions. Three consistencies are usually required. Based on practical experience, the company feels that a lubricant carrying a 33-pound load will give no trouble in the field.

Often gears and antifriction bearings are lubricated with the same lubricant. In this case, the mineral oil which is satisfactory for the gears is usually entirely satisfactory for the antifriction bearings. In numerous cases, however, to take care of the gear units, it has been found necessary for good operation to use an extreme pressure lubricant of approximately 90 to 150 seconds vis-

cosity at 210 degrees Fahr. These lubricants should carry a minimum load of 33 pounds on the Timken lubricant tester. The types of extreme pressure lubricants with which the Timken company has had success on these units are those having a lead-soap-sulphur base, a chlorinated sulphur base, and the straight chlorinated base products.

For table rolls, etc., encountered in mills and factories, the type of lubricant is dependent largely on the design of the closures. If the closures are tight, fluid oils are entirely satisfactory. As the frictional loads are lower with oil lubrication when this type of lubricant can be used the company prefers to recommend it.

A number of applications, however, are so designed as to make grease lubricants preferable. In such cases, under normal operating conditions, the usual lime soap grease is satisfactory. In cases where operating temperatures are somewhat high, a change to a soda soap grease which will take care of the additional temperatures encountered is advisable.

In mine car applications, the old type of plain bearings were usually lubricated with black oil, often called "black strap." However, since antifriction bearings have come into use in this type of service and have replaced plain bearings, grease lubrication is necessary. The antifriction bearings are enclosed in housings which should be filled with medium consistency grease, the lubricant serving as an additional seal to prevent water and dirt from entering the housings.

To counteract the harmful effects of both water and dirt, it has been advisable to recommend the use of heavier greases than are desirable for low frictional loads in the bearings. These greases are often heavier than mine car operators like to use for easy application of lubricant, but the improved operating conditions and decreased costs soon reconcile them to the change. The type of grease which has proved most successful for this service is the lime soap or water repellent grease of medium to heavy consistency.

Where Grease Withstands Heat

In cases where the mines are dry, however, it is not necessary to use a water repellent grease. In some of these dry mines there are long hauls above ground, the hauls being several miles in length, at high speeds, and down grade. This necessitates the use of brakes, which give rise to high bearing temperatures, causing the usual specified lubricant to melt and run out. In applications such as this, it has been necessary to use a high melting point soda soap grease.

This example illustrates the possibility that certain lubricants which are ordinarily regarded as highly satisfactory in a certain general field must at times be rejected. Likewise, the reverse is true. Consequently, greases which under the normal operating conditions of an industry would be rejected, must at times be definitely specified in order to take care of special conditions peculiar to a certain installation.

Ordinarily, the mine car greases which have proved most successful are lime soap products free from inorganic fillers, compounded from well refined mineral oils ranging in viscosity from 200 to 600 seconds at 100 degrees Fahr., the higher viscosity oils generally producing the most stable products.

For high-speed applications, such as electric motors, high-speed spindles, and similar equipment, designed for grease lubrication, best success has been obtained with soda soap products, etc. This type of grease does not separate at the usual operating speeds and temperatures as do the lime soap greases, resulting in better lubrication and much longer bearing life.

Prefers Short Fiber Grease

The type of soda soap grease which has given best service with Timken bearings has been the short fiber, smooth texture product. These greases do not have the same tendency to channel as do the somewhat stringy fibrous products, and their lubricating action seems to be similar to that of the lime soap greases. The channeling and poor lubricating ability of the stringy, fibrous greases seem to be more pronounced under low temperature operating conditions. The smooth textured soda soap greases which have given best results for average service have been those compounded with refined oils of from 200 to 600 seconds viscosity at 100 degrees Fahr.

Some of these soda products have a tendency to become quite stringy on being worked, while others become more smooth. Experience indicates that those with a tendency to become smoother give best results in service. It is not possible at this time to give enlightenment as to the cause of this phenomenon. Perhaps some manufacturer has the answer and will be willing to tell how to overcome it. Recently, two grades of a grease made by a certain company were tested in the Timken laboratory. One had a tendency to string out on working while the other became more smooth. Possibly a slight variation in the acidity or alkalinity may be the answer.

Industrial machinery frequently includes high-speed units in which oil lubrication is desirable. Usually these units are comparatively lightly loaded. However, high speeds often bring about conditions where overheating is encountered, at least until after the bearings are well run in. In such units well refined mineral oils usually are satisfactory. A number of cases, however, have been encountered where on new installations of bearings there was apparently an overloaded condition. In such cases, Timken practice has been to go to the use of an extreme pressure oil for a running-in lubricant, merely adding the extreme pressure base oil to the mineral oil. Usually the one charge of extreme pressure oil is sufficient to last the machine for the run-in period, after which straight mineral oils are entirely satisfactory.

Sight feed, constant level and wick feed oilers ordinarily are used on industrial equipment, the latter two generally being the most economical. To have a product which is economical for use with sight feed oilers, oils compounded with around ¼ to ½ per cent of soaps are used. Such compounded oils adhere better to bearing surfaces and also feed more slowly.

Ball mills, clay mills, etc., represent applications where the service is heavy and the speeds somewhat low. Usually heavy cylinder oils are entirely satisfactory for lubricating such applications, although at times it has been found advantageous to use extreme pressure products. By using a lighter bodied oil, but of the extreme pressure type, it is possible to reduce operating temperatures considerably, and also to show a marked saving in power. At the same time the heavy loads can be carried without harmful effects to the gears or bearings.

Merits of Circulating Systems

There are a number of applications for which circulating oil systems are desired, such as on gear drives, and the bearings connected with them in mills or other industrial units. The following advantages may be attributed to circulating oil systems:

1. Ample lubrication.
2. Circulation of the oil through the bearings has a cleansing action, washing out any foreign matter which might be present.
3. There is no churning of the lubricant, hence, with the minimum amount of lubricant present, lower operating temperatures generally are secured.
4. With a circulating system it is possible to provide for settling and filtering the lubricant. In case the lubricant has a tendency to become warm, it is possible to cool it separately, thus keeping the system supplied at all times with clean, cool lubricant.
5. The cooler operating conditions will reduce the oxidation or breaking down of the lubricant and thus increase its life.

To measure in the laboratory the

(*Please turn to Page* 52)

he dictates Wire Specifications

his wire must be free cutting

He may not know the technicalities of wire making, but he does know that when wire is free cutting he gets pinions with smooth bearing surfaces and without burred edges. The ability of Wickwire Spencer to produce Wissco Wire with predetermined characteristics has resulted from painstaking study of users' requirements and scientific planning of wire to give those characteristics. It can be truthfully said, therefore, that the user of wire dictates the specifications of Wissco Wire. You, too, may dictate as to Wire Specifications based upon your own requirements.

WICKWIRE SPENCER STEEL COMPANY
New York City; Buffalo, Chicago, Worcester;
Pacific Coast Headquarters: San Francisco;
Warehouses: Los Angeles, Seattle, Portland.
Export Sales Department: New York City.

WISSCO WIRE
by Wickwire Spencer

NRA MEMBER U.S. WE DO OUR PART

Wickwire Spencer manufactures High and Low Carbon Wires—in various tempers, grades and finishes—for your specific purpose. Hard-Drawn, soft or annealed Basic or Bessemer Wires—Hard-Drawn annealed, or oil-tempered Spring Wire, Chrome Vanadium Spring Wire—Valve Spring—Music—Clip—Pin—Hairpin—Hook and Eye—Broom—Stapling—Bookbinding—Machinery Spring Wire—Reed Wire—Clock—Pinion—Needle-Bar—Screw Stock—Armature Binding—Brush—Card—Florist—Mattress—Shaped—Rope—Welding. Flat Wire and Strip Steel, High or Low Carbon—Hard, annealed or tempered—Clock Spring Steel—Corrosion and Heat Resisting Wires. Consult the Wissco technical man on your wire problems, however large or small.

Beaded hoops are used in large quantities for binding these large casks for storing and transporting tobacco. This illustration shows casks in a warehouse of the Axton-Fisher Tobacco Co., Louisville, Ky.

LARGE USES OF STEEL IN SMALL WAYS

275th Article ◆ Tobacco Cask Hoops

BETWEEN 1500 and 1800 tons of hot-rolled beaded hoops for tobacco casks are consumed in this country yearly. This form of binding is one use of the broader designation of "slack barrel hoops" of which in recent years, as high as 35,000 to 40,000 tons of steel has been consumed annually.

Beaded hoops for tobacco casks, purchased largely by the tobacco driers in the South, generally are used in 2-inch widths by 22 Birmingham wire gage, and each hoop is rolled by the producer in lengths from 13 feet to 13 feet 8 inches. Usually the 13 foot 8-inch length is considered standard, although every length between 13 feet and 13 feet 8 inches is in a 2-inch classification.

Standard rolling tolerances are allowed on beaded hoops, which are hot rolled down to as low as 23 or 24 gage. After being rolled, rivet holes are punched in one or both ends of the hoop, and nail holes are then placed every 6 to 8 inches. The bead on the hoop is then made. Rivet holes are placed in one or both ends so that the cask may be easily bound. As a nail is driven into the cask first, the hoop is looped over it around the cask and then secured.

Tobacco driers generally obtain their requirements direct from American producers. However, a small percentage, about 150 net tons out of some 1500 to 1800 tons normally consumed in a year, is imported from producers abroad. Demand is usually seasonal with tobacco shippers in the Southeastern district of the United States usually buying in the spring and summer, and purchasers in the Kentucky-Tennessee district usually making their commitments in late fall or early winter.

Six Major Producers

Carnegie Steel Co., Pittsburgh; Acme Steel Co., Chicago; Conners Steel Co., Birmingham, Ala.; and Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., are American producers of beaded hoops for tobacco casks. This same group of manufacturers, plus the American Steel Band Co., Pittsburgh, and the Brainerd Steel Co., Warren, O., are also makers of slack barrel hoops.

Incidentally, it is a matter of interesting comment to note that demand for slack barrel hoops has a particularly barometric value, because the hoops are used in a variety of packing cases, such as for chemicals, lime, cement, flour, nails, etc. Experienced observers say that any revival of buying of slack barrel hoops accurately forecasts an improvement in general business.

Electric Furnace Best For High Test Cast Iron

There are several arguments in favor of melting high-test irons by some means other than the cupola, said R. G. McElwee, Ecorse Foundry Co., Ecorse, Mich., in recently addressing the Detroit section, American Society of Mechanical Engineers. The electric furnace has been chosen in many cases because it offers a higher degree of heat, much better condition of atmosphere in the furnace—by proper operation the atmosphere should be almost inert—and there is another factor which is not generally spoken about which is quite vital, and that is the fact that actual melting takes place much slower in the electric furnace than in the cupola.

The actual melting of the iron in the cupola is rapid when the charge has fallen to the melting zone, whereas in the electric furnace the batch is brought up to heat rather slowly, and the greater time promotes much better dissipation of all of the elements throughout the entire charge. Therefore, segregation is much less likely with this method of melting.

Another factor is that in electric furnace melting we eliminate a variable, which is quite troublesome in cupola foundries where close control is necessary, and that is the relative humidity of atmospheric air from day to day.

When you consider that from 25,000 to 30,000 cubic feet of free air are blown into the cupola blast to melt one ton of iron, and then if you will calculate the difference in moisture content from day to day in this amount of air, you will not be surprised that this factor vitally affects melting conditions.

This is particularly true in the making of small intricate castings, such as piston rings, although it probably affects all castings more than even foundrymen realize.

Traffic Signs Made with Baked Enamel Finish

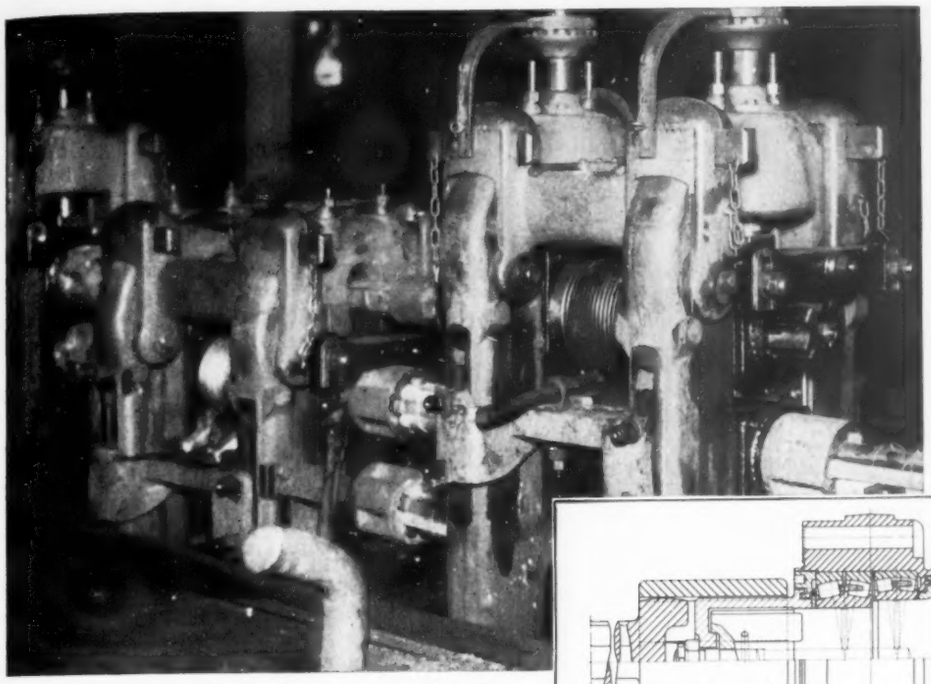
In an article, "How Traffic Signs Are Cut, Painted, Mounted and Maintained," appearing in the Aug. 13 issue of STEEL, page 28, the following statement was made: "Enameled signs were tried out sometime back but they cracked in service and became faded."

This statement referred to baked enamel signs and not porcelain enameled signs as may have been inferred. The coating on these signs was baked at a temperature of 180 degrees Fahr.

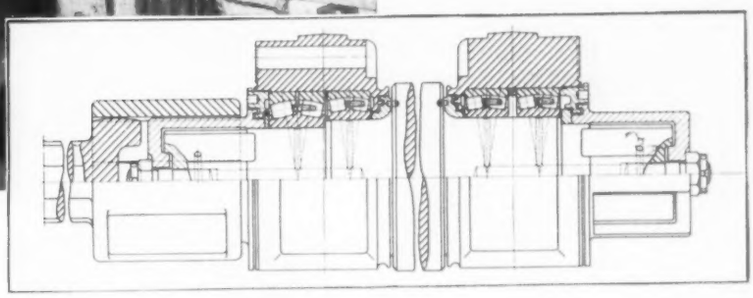
Modernize Mills By

CHANGE-OVER

To SKF Roll-Neck Bearings!



Five of 1050 SKF-equipped stands. Typical SKF installation on 11" rod mill train in operation at Nykroppa, Sweden. Application at right.



NEW MILL PERFORMANCE WHEN BEARINGS ARE SKF

IMPROVED TOLERANCES is but one important advantage obtained with SKF Self-Aligning Roll-Neck Bearings! There are power saving . . . steady operation . . . less scrap . . . rapid roll changes! Chocks and bearings are slipped on necks as a unit!

SKF Roll-Neck Bearings provide an equalized load distribution insuring the full bearing capacity and the longest life! And the mounting easily lends itself for adaptation to existing rolls! Achieve modern mill performance by running your old mills on SKF Bearings!

SKF
Roller Bearings

3319 SKF INDUSTRIES, INC., Front St. and Erie Ave., Phila., Pa.

Decalcomanias Finding Wider Use for Product Nameplates

BY HAROLD B. VEITH

SEVERAL major considerations face manufacturers when they choose a nameplate, trademark, instruction chart or other designation to be placed on the finished machine or metal product. One is the ease and dispatch with which it can be applied and how this operation will fit into the production schedule. Other factors are appearance and effectiveness.

Because decalcomania transfers meet these requirements, various machinery manufacturers are adopting them to bring to the attention of the buyer and user an attractive nameplate, as well as various other data pertaining to the make of machine. The transfer process also is being employed to provide plates to indicate for example the proper oil level which should be maintained, cleaning instructions, and the like.

Perhaps the most popular transfer is the water type shown on the gasoline engine and washing machine shown in Figs. 1 and 3, respectively. This kind of transfer lends itself to high production schedules. The operator who applies them usually at the end of the assembly line, need only dip this transfer in water, allowing it to remain about 30 seconds. This loosens the transfer from the paper to which it is attached. Subsequently he slides the transfer off face up, onto the surface of the machine. Once in the desired location, the transfer is pressed down with a blotter, soft cloth or dampened felt roller and allowed to dry. Thus the operation is completed.

On heavy equipment where service is more rugged and on machinery which is exposed to the elements a differently constructed decalcomania transfer, of the varnish type, is recommended. This type also is advisable when the trademark consists of open lettering such as that on the adding machine shown in Fig. 2. To apply the transfer a thin coating of special cement is spread on the color side of the sheet. If the special cement is not available a good quality of quick-drying varnish, thinned with turpentine, will serve the purpose.

How Transfer Is Set

After allowing the transfer to stand until the cement or varnish becomes sticky or tacky it is placed on the desired spot which previously has been wet slightly with a damp sponge. When the transfer is in position it is rolled with a soft rubber roller. The next step is to saturate the paper which covers the lettering or design. When the paper is saturated thoroughly it is pulled off and the transfer is washed to remove the gum deposit. Surplus cement is taken off the surface around the transfer with benzine. On white enamel or delicate colors kerosene is used. The transfer should be allowed to dry thoroughly at least 12 hours before covering with varnish. As an extra protection to intricate designs a double paper covering is used for another series of this type of decalcomania.

A third available transfer which also is known as a water type is intended for hard service in weather, etc., but differs from the foregoing in that under usual conditions no varnish is required in applying it. After the surface to which it is to be applied is cleansed with a damp cloth the transfer, which has been

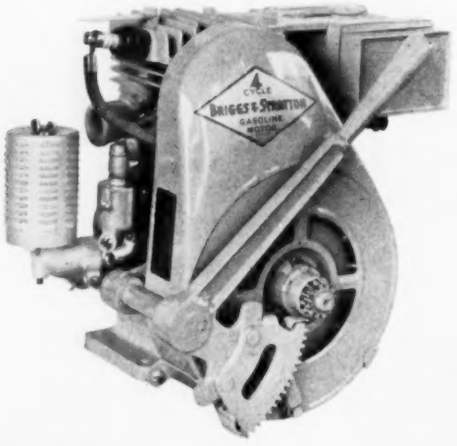


FIG. 1 (Right)—The decalcomania gracing this gasoline engine is equal to the rugged service to which this type of equipment is subjected

FIG. 2 (Left)—Varnish type transfers meet the requirements of open lettering such as found on this adding machine. Fig. 3 (Right)—A washing machine on which a decalcomania provides an attractive and effective trademark

dipped in water a few seconds, is placed down in the same manner as the varnish type. The paper covering them is slid or peeled off, exposing the face of the design on the metal surface.

Decalcomanias rapidly are replacing the old type of nameplate which usually was fastened to the machine with screws. In many cases it looked like something the engineer forgot and placed it there as an afterthought. Then there is the long accepted "cast-in" trademark which has been the practice among the heavier machinery builders. This also is giving way to the decalcomania, particularly since it now is possible to obtain a transfer that will endure the severe treatment given such equipment.

Because the water-type transfer has been developed to the point where even it can handle reasonably open-letter work and since it does not require the time and care in application peculiar to the other types, there seems to be no doubt that it is the most desirable for all practical purposes. Any artistic design or color combination can be worked out in these decalcomanias.

Studies Physical Properties Of Low-Alloy Cast Steels

A COMPARISON of the mechanical properties of 25 alloy steels of low-alloy content and one simple carbon steel, and a comparison of properties after nine different heat treatments were discussed in a paper by T. N. Armstrong,, assistant metallurgist, Norfolk, Va., navy yard, presented before the American Society for Metals during the National Metal congress in New York, Oct. 1-5. The steels studied were limited to those which give a combination of strength and high ductility required in ship castings. Quenching in liquids was not included in the heat treatments, the speaker asserted, because of the impracticability of quenching the intricate castings required in ship construction.

Copper-Bearing Show Well

Mr. Armstrong said that results show that excellent mechanical properties can be obtained from cast steels comparatively low in alloy content, providing the manganese content is above 1 per cent. Excellent results were obtained from several copper-bearing steels containing small quantities of the other alloys, with the most consistent results obtained from nickel-manganese steels.

The highest strength for the quantities of carbon and alloys present was obtained in the nickel-manganese-vanadium steels. The molybdenum steels showed better resistance to impact than any of the high strength steels, and the copper steels possessed the best ductility in the as-cast state.

The highest results, for all steels excepting those low in carbon, were obtained by double normalizing and tempering. This treatment, the speaker asserted, gives a high ratio of yield point to tensile strength, high dynamic properties and elongation approximately as high as obtained by double annealing.

Dendritic structure appears to be eliminated in cast steels only by comparatively rapid cooling through the critical range. Normalizing, Mr. Armstrong said, results in much finer grain and better dispersion of constituents than obtained by any annealing treatment.

Investigates Tool Steels

A study of three high-carbon high-chromium tool steels was discussed by W. H. Wills, associated with the metallurgical department of the Ludlum Steel Co., Dunkirk, N. Y. One of the steels discussed was a straight-chromium type, with the second resembling the first, but with the addition of 1 per cent vanadium, and the third an air-hardening type. Manufacture, heat treatment and physical properties were described, with results set forth of special tests comparing the dimensional changes of the second and third types.

Commenting on their values, the speaker stated that the second type of steel has proved a more popular grade than the first due largely to its better resistance to shock, other qualities being much the same. The third type, with its air-hardening property, low distortion and better machining quality, than the others, is in good demand, although some claim, he said, that the second type is somewhat better as to resistance to abrasion. Taking into account all factors, the third type of steel appears to be the most universally adaptable of the three high-carbon, high-chromium steels, Mr. Wills concluded.

In a written discussion by Mr. Scheid, of the Columbia Tool Steel Co., Chicago Heights, Ill., it was pointed out that with some 37 different steels of almost as many analyses offered, a wider range is necessary to indicate the potential physical values of the high-carbon, high-chromium group.

The high impact values of the third type of steel, according to Mr. Scheid, are due to decreased carbon content, this decrease in carbon materially reducing the abrasive resistance of the steel. However, further impact values with variation of quenching temperature and time at quenching temperature are necessary if the impact test is to be utilized as a means of judging the desirability of the composition.

Disagrees on Heat Treatment

Mr. Scheid said that his work has led him away from vanadium or vanadium-molybdenum combination to a tungsten-silicon alloy. Mr. Scheid did not agree with results on heat treatment, particularly in regard to hardening temperatures. It would appear, he said, that with the proper combination of time and temperature a slightly lower quenching temperature is desirable and necessary to develop the best physical properties.

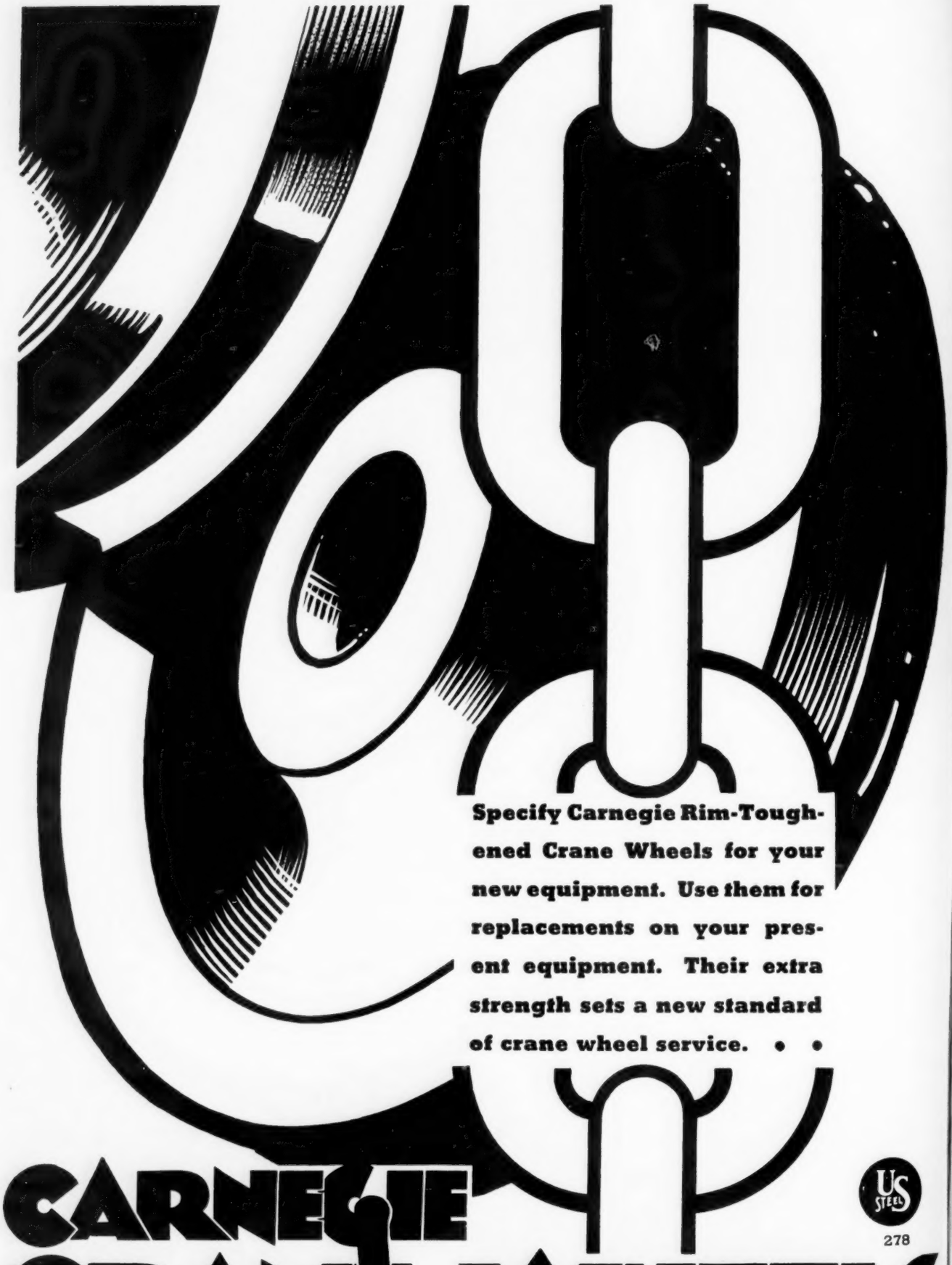
A. H. d'Arcambal, consulting metallurgist, Pratt & Whitney Co., Hartford, Conn., stated that the Pratt & Whitney Co. has adopted the third type of steel, discussed by Mr. Wills, for certain products. It is easier to machine, hardens just as satisfactorily at a slightly higher heat and is tougher than the original high-carbon, high-chromium grade, he stated. Preference was given to oil quenching over air cooling due to slightly higher hardness obtained in the as-quenched condition.

A comparison of the corrosion resistance of several wrought irons made by different processes, was presented in a paper by O. A. Knight, associate professor of metallurgy, Pennsylvania State college, State College, Pa., and J. R. Benner, school of mineral industries, Pennsylvania State college.

In presenting the paper, Prof. Knight said that in salt water exposure bright specimens indicated that Roe wrought iron had a slightly lower rate of loss than others studied. The rate for hand-puddled iron and Byers-Aston iron was about the same, but slightly higher than the Roe iron. The specimens from which the mill scale was not removed, showed hand-puddled iron to have the lowest grade of loss, Roe iron next and Byers-Aston iron, the highest grade of loss.

In the sulphuric acid exposure, bright specimens of Roe iron showed the lowest loss rate, with hand-puddled close, but a little higher, while the Byers-Aston iron suffered the greatest loss. The specimens from which the mill scale was not removed showed the irons to be in

(*Please turn to Page 52*)



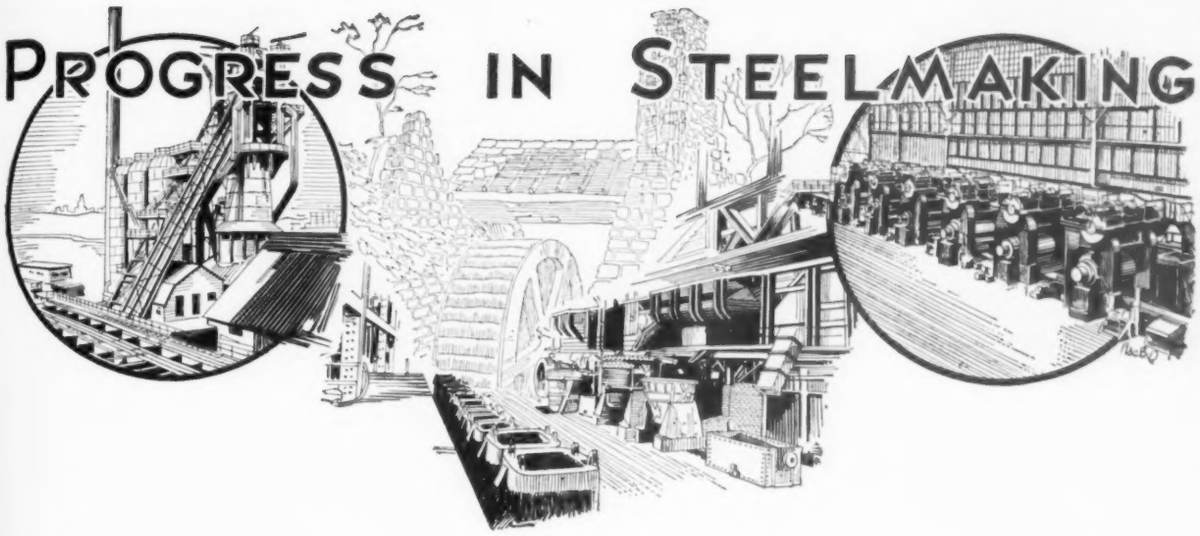
Specify Carnegie Rim-Toughened Crane Wheels for your new equipment. Use them for replacements on your present equipment. Their extra strength sets a new standard of crane wheel service. • •

CARNEGIE CRANE WHEELS

278

Product of **CARNEGIE STEEL COMPANY** • *Subsidiary of United States Steel Corporation* • **PITTSBURGH, PA.**

PROGRESS IN STEELMAKING



Reduces Cost of Rolling

Use of breakdowns sheared from wide, hot rolled strip in place of the ordinary sheet bar has reduced materially the production cost of hot rolled sheets. A special high-speed roller bearing mill, which does not infringe 4-high mill patents, has been developed and patented on which a production of from 10,000 to 20,000 tons per month of breakdowns can be produced, the tonnage depending entirely on the widths and gages required. Slabs used on this mill may be either rolled or cast by one of several acceptable methods. Because of the comparatively small investment necessitated, breakdowns can be produced on this mill at low cost, fixed charges included.

• • •

Operation Is Flexible

A blast furnace blown with 70 cubic feet of air per minute per square foot of hearth area will travel as well as when blown with twice this volume of wind, according to a blast furnace operator in the Great Lakes district. Greater flexibility in operation in afforded particularly on a stack having a large hearth.

• • •

Settings Are Identical

Return to the identical setting at any time is a feature of a new regulating valve built with an opening indicator. While intended primarily for controlling the flow of fuel oil, the valve also may be used to process fluids which require minute regulation. It is built with a rotating, conical, plug-shaped gate, containing a slot parallel to the axis, which rotates within a conical seat cylinder. The latter has a tapered slot at right angles to the slot in the plug. As the plug is rotated, the area exposed by the crossed slots can be adjusted to any size between zero and maximum. The valve handle carries a pointer which operates on a scale to permit accurate adjustment of the setting.

• • •

Improves Coreless Unit

Recent improvements in the structural details of high-frequency, coreless-induction furnaces involve moving the tilting trunnions from the furnace box to the supporting stand thus strengthening the furnace structure and supporting the turns of the furnace coils more rigidly.

• • •

Acid Seepage Is Visible

Invisible damage to foundations and underground structures, caused by the seepage of acid into the soil through defective submerged sewers which serve pickling installations, is a large expense. This condition has been eliminated permanently on a recently completed continuous pickling unit by scientifically designing a sewer with a life expectancy comparable to that of the other auxiliaries. The factor of invisibility has been circumvented by locating the sewer above the floor level. By this arrangement leaks immediately become apparent before any considerable damage is done.

• • •

Surface Wear Is Small

After two years of rolling high-carbon and stainless steels, the average loss in the diameter per dressing of the alloy steel rolls used on a Steckel-type mill in the Pittsburgh district amounted to only 0.0015-inch.

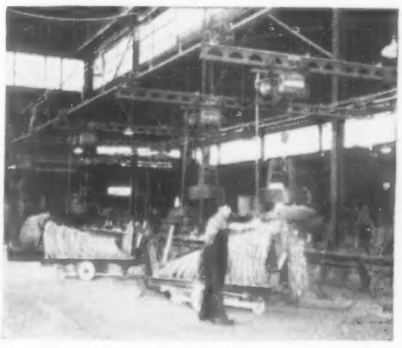
• • •

Tool Life Is Extended

Abrasive elements, which tend to wear away the cutting edges of tools, have been eliminated from bessemer screw steel by a process recently developed by a manufacturer in Pennsylvania. This advancement, it is claimed, has been accomplished without change in the analysis and without affecting the physical properties of the material. While no higher

Increases Handling Efficiency

WIRE COILS HANDLED BY ELECTRIC HOIST: As a part of a modernization program a western wiremaker recently completed the installation of 17 electric cranes and hoists for block stripping in the wire mill. This application of hoist equipment, according to company officials, has increased the efficiency in handling of bulk wire. The hoists with but one 220-volt motor and rigid arm push-button control, each have a capacity of 600 pounds and a lifting speed of 34 feet per minute. The hoists were built by the Harnischfeger Corp., Milwaukee, and are equipped with trolleys furnished by the Cleveland Tramrail division, Cleveland Crane & Engineering Co., Wickliffe, O.



Stripping the wire drawing blocks in a western plant is facilitated by 17 electric cranes and hoists

feeds and speeds are reported beyond those already obtainable with steels of these analyses, the developmnt is said to have effected production economies through the extension of tool life and the elimination of frequent machine shutdowns.

• • •

Controls Stripper Tongs

Thrustors now are being used on ingot mold stripping cranes for engaging and disengaging the tongs.

• • •

Power Requirement Varies

Piercing 18-8 nickel chrome steel requires 2¼ times as much power as the piercing of plain carbon steel, according to a tubemaker. The piercing of NCT3, an alloy steel containing 25 per cent chromium, 21 per cent nickel and 0.30 carbon, which is used in hydrogenation work, requires 5 times as much power as plain carbon steel. The secret of piercing this particular steel is to perform the operation when the metal is within 25 degrees of the correct temperature.

• • •

Zinc Bath Is Insulated

Oxidation of the galvanizing bath is prevented at a wire drawing plant in the Chicago district by covering the molten zinc with silocel. The latter also serves to insulate the bath against the loss of heat.

Much Machinery Lore In One Compact Volume

Machinery's Handbook, fabrikoid; 1592 pages, 4½ x 7 inches, gilt edges and thumb index; published by Industrial Press, New York; supplied by STEEL, Cleveland, for $6, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, London.

The ninth edition of this work has been revised to bring to date such portions as have been subject to advances in the art of machinery design and construction. Much of the revision in the present edition is inclusion of recent or revised engineering standards.

In selecting material for this handbook from the almost limitless supply pertaining to mechanical subjects the plan has been to consider primarily needs and requirements in designing and manufacturing departments of plants building machinery.

Departments in which revisions and additional data are presented include the following: Load capacities of ball and roller bearings; developments in plain bearing design; revised S. A. E. standards; socket-type set screws and cap screws; additional screw thread data; standard milling cutters; American standard chain sprockets; revised speed and feed data; hardness conversion table; electric motor characteristics; die-casting compositions; weight tables for brass, aluminum and copper.

German Railroad To Make Tests on Welded Rails

Experiments in the use of welded rails are being conducted by the German State railway, according to a report from the American consulate-general, Berlin, made public by the department of commerce, Washington. A trial railroad line, it is pointed out, has been constructed of welded rails, each approximately 98 feet long and so connected that there are almost no joints.

An express train, without passengers, will be driven over this line until a mileage of about 62,500 is attained. These tests are to last about three months with ten trips being made each day over the experimental line at a speed of from 75 to 95 miles per hour.

The purpose of the tests, the report continues, is to determine whether these welded rails can be used at such high rates of speed and whether or not they exercise a disadvantageous effect on the train. If the trials prove satisfactory, the rails are to be introduced on all express lines in Germany.

Counter for Reversing Cold Strip Mill Indicates Number of Wraps on Reel

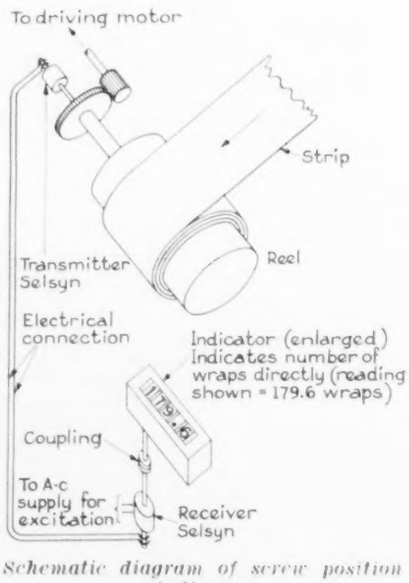
BY F. MOHLER
General Electric Co., Schenectady, N. Y.

FROM a production and a quality standpoint, it is highly desirable to run a reversing cold strip mill at its normal rolling speed as much as possible. At the end of each pass, however, the operator must begin to decelerate the mill in time to prevent the unrolled portion of the strip from passing through the rolls. He should, therefore, know the exact number of wraps on the reels at all times.

The number is difficult to judge by observation, because the number of wraps for a given coil diameter is dependent upon the thickness of the strip. This is changing continually with each pass.

The simple counting device shown in the accompanying illustration will give the operator accurate indication at all times. The counter is of the reversible type, that is, when rotated in one direction it adds, and in the other it subtracts. Thus, if 179.6 wraps are wound up, 179.6 wraps must be unwound, irrespective of the thickness of the cold rolled strip going through the mill.

The Selsyns shown in the sketch are exactly equivalent to a mechanical tie between the reel drum and the wrap counter. They are used to eliminate shafting and gearing, and to permit convenient location of the indicator. The counter can be reset to the zero position by a simple mechanical lever or key.



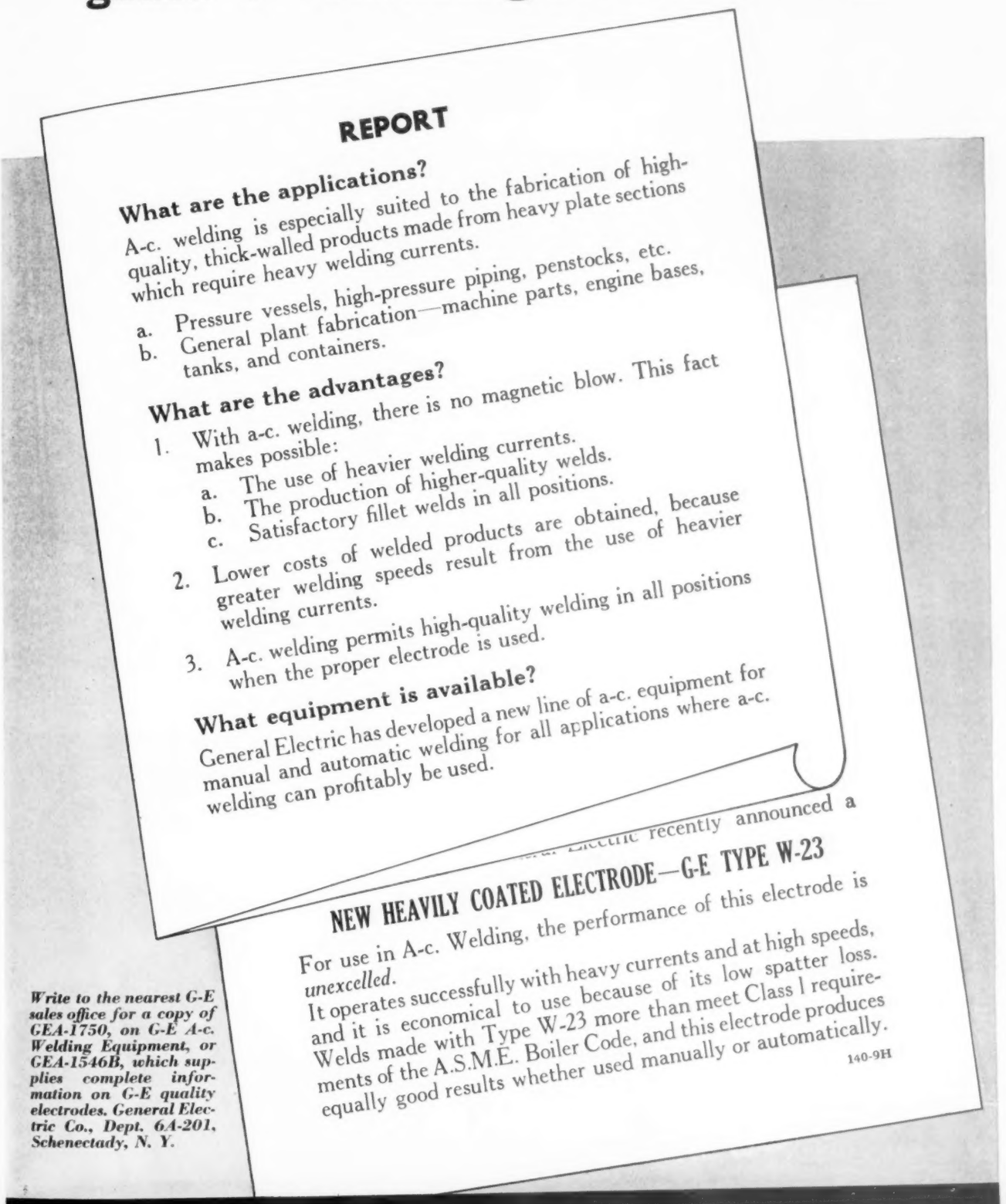
Schematic diagram of screw position indicator

Awnings of Sheet Steel

Sioux Falls Metal Culvert Co., Sioux Falls, S. D., is the manufacturer of awnings fabricated from steel sheets as shown on page 32 of STEEL of Oct. 15. These awnings are of a self-ventilating type invented by P. F. Gardner of this company. Application has been made for patents covering this product.

W. C. Scott, Metropolis, Ill., who incorrectly was named as the producer of these awnings, also manufactures awnings from steel sheets but of a design different from that portrayed.

A report on the findings of 15 years' investigation of Alternating-current Welding



REPORT

What are the applications?

A-c. welding is especially suited to the fabrication of high-quality, thick-walled products made from heavy plate sections which require heavy welding currents.

a. Pressure vessels, high-pressure piping, penstocks, etc.
b. General plant fabrication—machine parts, engine bases, tanks, and containers.

What are the advantages?

1. With a-c. welding, there is no magnetic blow. This fact makes possible:
   a. The use of heavier welding currents.
   b. The production of higher-quality welds.
   c. Satisfactory fillet welds in all positions.
2. Lower costs of welded products are obtained, because greater welding speeds result from the use of heavier welding currents.
3. A-c. welding permits high-quality welding in all positions when the proper electrode is used.

What equipment is available?

General Electric has developed a new line of a-c. equipment for manual and automatic welding for all applications where a-c. welding can profitably be used.

...Electric recently announced a

NEW HEAVILY COATED ELECTRODE—G-E TYPE W-23

For use in A-c. Welding, the performance of this electrode is *unexcelled*.

It operates successfully with heavy currents and at high speeds, and it is economical to use because of its low spatter loss. Welds made with Type W-23 more than meet Class I requirements of the A.S.M.E. Boiler Code, and this electrode produces equally good results whether used manually or automatically.

140-9H

Write to the nearest G-E sales office for a copy of GEA-1750, on G-E A-c. Welding Equipment, or GEA-1546B, which supplies complete information on G-E quality electrodes. General Electric Co., Dept. 6A-201, Schenectady, N. Y.

GENERAL ELECTRIC

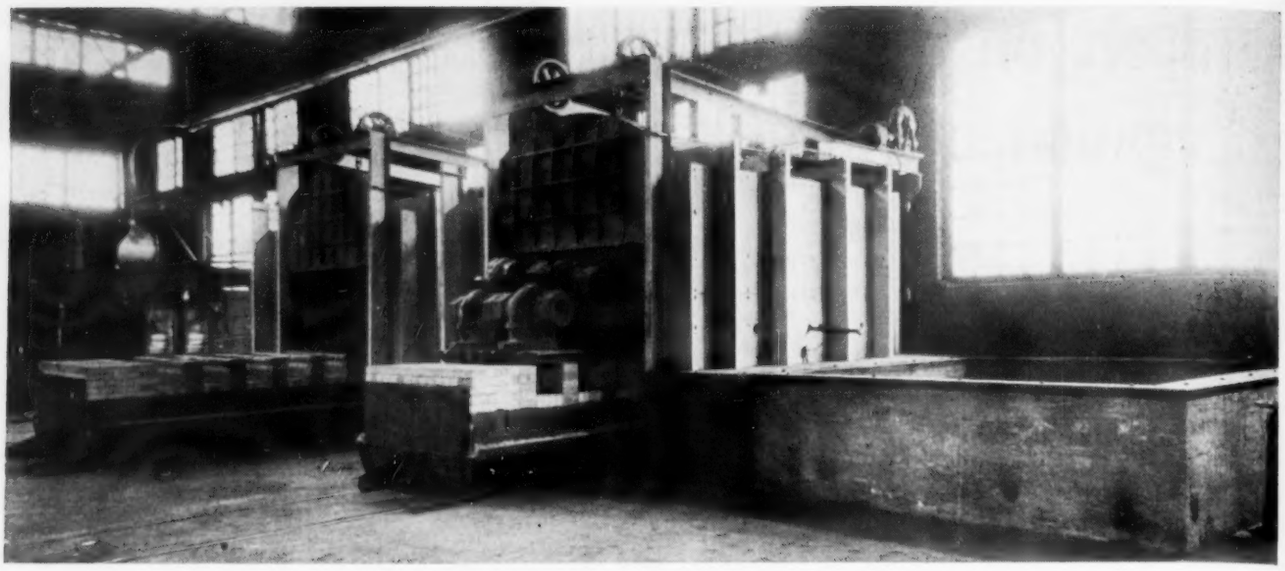


Fig. 1—Gas-fired heat treating furnaces equipped with automatic temperature control

Heat Treating Steel Castings Improves Physical Values

BY JOHN D. KNOX
Associate Editor, STEEL

BOTH carbon and alloy steel castings show tremendously improved physical properties — static and dynamic — when heat-treated by quenching and tempering. Compared to annealed steel castings the elastic limit is increased about 45 per cent, ultimate strength 25 per cent and impact strength, as measured by Charpy and Izod tests, about 100 per cent. Furthermore, the machinability is definitely improved.

In the accompanying table the physical values are the average of 1880 heats of 0.30 per cent carbon basic open-hearth and acid electric steel. The tests were made on 1½-inch square bars which were annealed or heat treated and machined.

Physical Values Vary

The brinell hardness of the heat treated casting, as will be noticed, is higher than the annealed casting, and because of the uniform structure the machining qualities are highly satisfactory. At the plant of the Bonney-Floyd Co., Columbus, O., where the heat treatment of steel castings is carried out on a large scale, every facility is provided for controlling the various steps in the process. Complete laboratory equipment for testing and controlling the metals and heat treating results is available and a uniform product is secured by careful metallurgical procedure in every stage of the process.

Fig. 2 shows, in an interesting and comprehensive manner, what can be done by the heat treatment of steel castings. This graphic representation of the physical properties depicts clearly the evolution of a carbon steel test bar to its optimum properties, or in other words the properties existing in the as-cast, annealed normalized—tempered and quenched—tempered conditions. Even to the layman, the photomicrographs to the right of each bar, should leave no doubt in his mind as to the superior product.

Certain rules are observed in order to avoid cracking during the quenching operation. Thoroughly refined

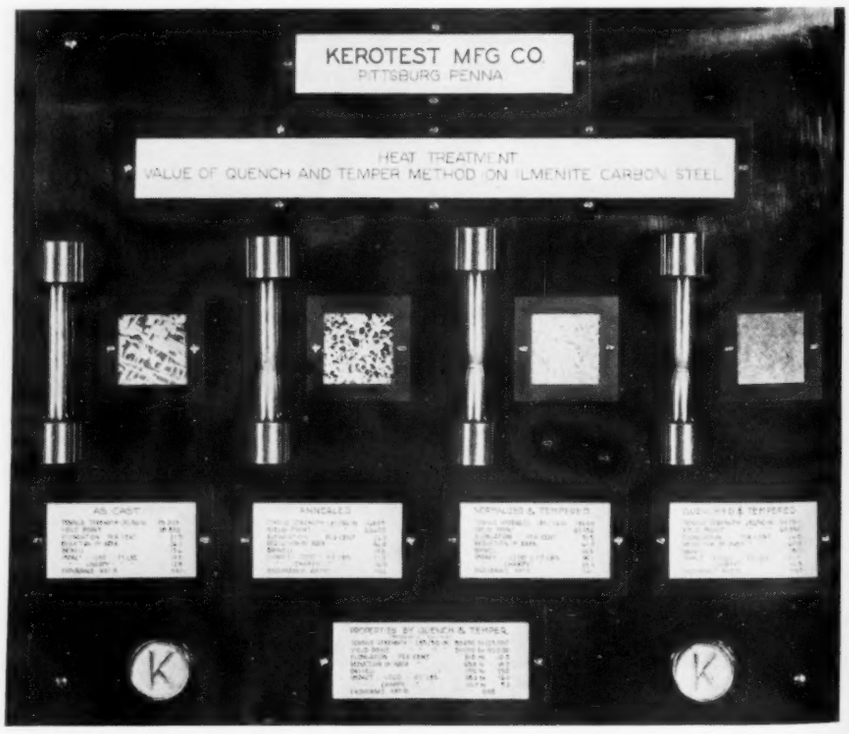


Fig. 2—Graphic representation of physical properties of carbon test bar

metal is of prime importance. Then, too, the cast steel commodities must be at a uniform as well as the proper temperature before subjecting them to the quenching bath. Finally, the temperature at which the castings are removed from the quenching bath, also has an important bearing on the results.

Each of the heat treating units shown in Fig. 1, is served by a car bottom hearth 5 feet wide and 9 feet long, the height from the car bottom to the start of the arch being 3 feet. Heat losses are held to a minimum by insulating the furnace and hearth of the car. The units are gas fired and a non-oxidizing atmosphere is maintained by burners and mixers of the proportional type. Automatic electric recording pyrometers control the temperature throughout the heating and tempering periods.

Temperature Is Uniform

Design of the furnace and car assures a circulation of hot gases and a uniform temperature in the heating chamber. Batches of castings are loaded on a tray and are transferred from the furnace to the quenching tank by an overhead crane. The hoist is equipped with a semi-automatic latch which automatically takes hold of the tray when lowered, thus avoiding any delay in handling the charge. Only about 40 seconds is required to transfer the work from the furnace to the quenching bath. Therefore, little time is available for the outer parts of the work to air-cool, below the critical point. The furnace door hoist and cars are motor driven, their actuation being controlled by push button either from the floor or crane.

In heat treating small bevel gears for power shovels, rolling mill conveyor tables, etc., each end of the bore is plugged for the purpose of drawing the center to the desired temperature. The process is covered by patents. Following the heating period the work is placed in the quench tank, the time of immersion depending on the size of the gear and the number of teeth. The bevel gear for rolling mill conveyor table service, shown in Fig. 5, was heat treated by this method to a brinell hardness of 187 at the bore and of 331 at the rim of the teeth, or a differential of 144 points.

The boom swing pinion for power shovels, shown in Fig. 3, has a brinell hardness at the rim of 223, at the base of the gear teeth of 341 and at the bore of 212. The spur gear for rolling mill service, shown in Fig. 4, has been differentially heat treated for a hardness at the teeth of 341 and at the bore of 179, brinell numbers. The Bonney-Floyd Co. recently furnished large wheel centers for high-speed electric locomotives made of heat treated carbon steel. The diameter of the wheel is 56 inches and of the hub 18 inches. The 13 spokes each are 2¼ inches thick at the hub and taper to 1⅛ inches [illegible] at the rim. The weight of the wheel center in the rough state is 1650 pounds. Three centers were poured per heat of acid electric steel.

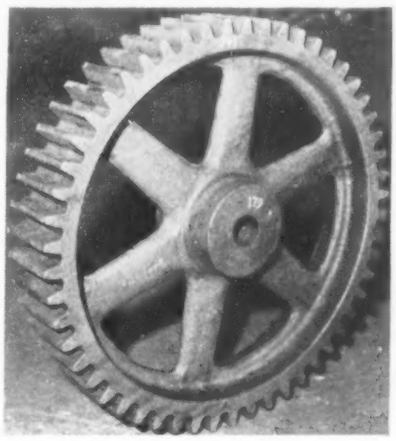


Fig. 4—Spur gear for rolling mill service

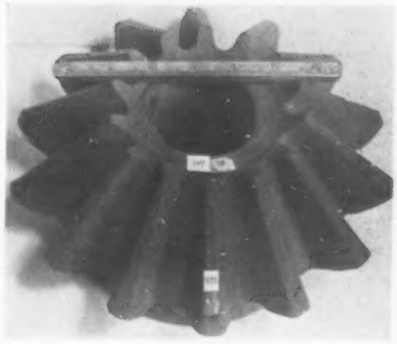


Fig. 5—Bevel gear for rolling mill conveyor table

Physical Values Cited

Three wheel centers were water quenched and drawn simultaneously, the physical values averaging 94,020 pounds per square inch in ultimate tensile strength, 69,480 pounds per square inch yield point, 26 per cent elongation in 2 inches, 61 per cent reduction of area and 180 brinell hardness.

Large increases in the allowable fiber stress in cast machine parts has permitted uses of heat-treated low-carbon steel to reduce the weight and cost of castings. The heat treatment provides a tough, wear resisting hardness at points of wearing contact and yet permits machining where necessary after treatment and obviates the necessity of finish grinding.

Fig. 3—Boom swing pinion for power shovel

Physical Values of Plain Carbon Cast Steel

	As-cast	Annealed	Heat treated
Ultimate strength, lbs. per sq. in.	74,100	75,000	80,000 to 125,000
Yield point, lbs. per sq. in.	37,100	41,500	50,000 to 97,000
Elongation in 2 inches, per cent	19.5	24.5	30 to 10
Reduction of area, per cent	31.0	46.2	65 to 20
Brinell	160	145	155 to 250
Izod	16	20	48 to 15
Endurance ratio	0.40	0.44	0.50

Changes Affected by Annealing and Heat Treating

(As-cast considered as unity)

	Annealed, % change	Heat treated, % change
Ultimate strength	+ 1.1	+ 12.6
Yield point	+12.0	+ 53.8
Elongation	+30.8	+ 61.5
Reduction of area	+51.7	+124.1
Brinell	— 8.3	+ 2.5
Izod	+23.5	+158.8
Endurance ratio	+10.0	+ 25.0

NEW EQUIPMENT

PRODUCTION FABRICATION
TREATMENT FINISHING

Alternating-Current Welder—Lincoln Electric Co., Cleveland, announces a new alternating current welder which will be known as the "Shield Arc AC". This new welder, shown herewith, is of revolutionary design and is of the motor generator type which takes 2-phase or 3-phase alternating current of standard voltages and frequencies and converts it into alternating current of lower voltage and at that higher frequency most suitable for arc welding with either heavily coated or washed electrodes in all positions.

Since this type of welder draws from the line balanced power at lower amperage and higher power factor, the regulation of the transmission equipment is materially improved over that of the usual transformer type.

Lincoln "Shield Arc AC" welder of motor generator type

The new unit is built in portable and stationary alternating current motor-driven models in two sizes. The smaller capacity machine can be used for continuous welding with electrodes of 3/32 inch to 5/16 inch in size; the larger capacity welder handles electrodes from ⅛ inch to ⅜ inch in size. These machines are wired for 220, 440 or 550 volts, alternating current supply, 2 or 3 phase, 50 and 60 cycles.

◆ ◆ ◆

Chipper's Goggle — Chicago Eye Shield Co., 2300 Warren boulevard, Chicago, recently announced a new chipper's goggle, shown herewith. It is designated No. 535 and has a number of outstanding features that should make this eye protective device popular with men doing chipping or other impact hazard work. This new and unique goggle fits any facial contour and is of a much shallower design than formerly, so that the lenses set closer to the eyes and give a wider range of vision.

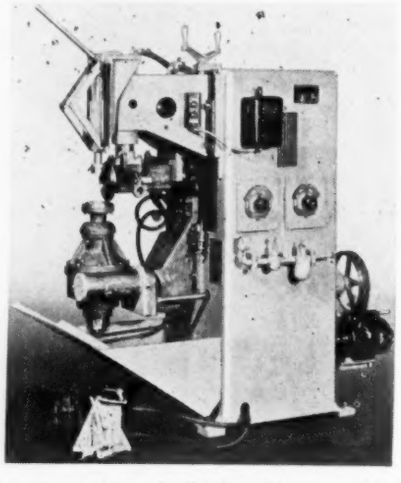
Chipper's goggle introduced by Chicago Eye Shield Co.

All metal parts are finished in black to prevent glare and are corrosion proof. A new type ball chain bridge allows for quick and easy adjustment of width, and a new type retaining ring for holding lenses is furnished. An exclusive feature is the baffled vents in edge of eye cups under lens, giving cross circulation of air across the under surface of lens. Weight is less than 2½ ounces. It is claimed that this new goggle does not fog, is safer, offers excellent protection from flying chips, stray metal, etc., and is comfortable to wear.

◆ ◆ ◆

Seam Welder—Thomson-Gibb Electric Welding Co. Bay City, Mich., is calling attention to its new special seam welder, shown herewith, which is being used by General Electric to assemble the compression headers in electric refrigerators. The header is a ball shaped unit made up of two half spheres, with outwardly turned flanges. Seam welding makes the assembly of these units both simple and rapid.

Bottom half of the header is set in place in the lower welding roll which is shaped to hold it in exact position. The top half is then placed under the upper or idler roll and quickly adjusted by a hand toggle work locator. A special worm drive operates the lower roll and a variable speed pulley controls the welding speed within a range of 1½ to 4½ feet per minute.



Seam welder built by Thomson-Gibb Electric Welding Co.

◆ ◆ ◆

Cemented Carbide Grinding and Finishing Machine—Ex-Cell-O Aircraft & Tool Corp., 1200 Oakman boulevard, Detroit, recently announced a new grinding and finishing machine for sharpening tungsten and tantalum carbide tools. The unit, shown herewith, is compact and sturdy. An inbuilt three-quarter horsepower motor mounted at the top of the machine drives two diamond impregnated wheels.

Ex-Cell-O cemented carbide grinding and finishing machine

Coolant is supplied to each wheel to keep the wheels clean and to control the generated heat at the point of contact between the wheel and tool being sharpened. At the present time plain water only can be used as coolant due to the nature of the bonding of the wheels. A reversible switch on the motor conveniently located at the rear of the machine provides the correct rotation of the wheels for both right and left-hand tools.

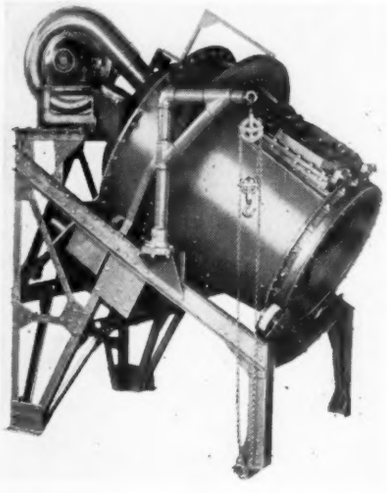
A large guard in the form of a hood covers the spindles and wheels, which is shown in phantom in the accompanying illustration. Each end of the guard is left open, allowing the operator complete freedom to use the entire length of the table. Sliding doors in the guard at both the

front and rear of the machine permit the operator to hold the tool parallel with the face of the wheel when required. Suitable adjustable water guards (not shown) are provided at each end of the machine to protect the machine operator while sharpening the tools.

♦ ♦ ♦

Blast Cleaning Unit — W. W. Sly Mfg. Co., 4703 Train avenue, Cleveland, recently has introduced a new barrel-type unit for cleaning castings, which employs a blower to supply the blast. The barrel has an inner and outer shell with the inner shell 42-inches in diameter and 36-inces deep. The inner shell is of ¾-inch steel, perforated with ½-inch holes to provide an outlet for the abrasive, dust and dirt. An outer shell of 3/16-inch steel, slightly tapered, is attached to the mill barrel and revolves with it.

A blower direct connected to a 10 horsepower motor is mounted against the high end of the tilted barrel, with a nozzle which directs the blast into the barrel at an angle. The bottom headplate of the barrel is cone-shaped and corrugated to give the castings a turning-over action. The nozzle is so arranged that the blast will hit the center of the load as it creeps up on one side of the revolving barrel. A gearhead motor, which is a part of the mill construction,



Sly barrel-type unit combines tumbling and blasting

drives the unit. The motor has two speeds, permitting the mill to revolve at 6 or 12 revolutions per minute. At 12 revolutions per minute the mill can be used for tumbling without blast and at 6 revolutions it can be used as a blast mill. However, it can also be used as a combination tumbling and blast mill by running at 12 revolutions per minute with the blast on.

The door for loading and discharging is on the side of the barrel and has an opening 24 x 28-inches long. The load capacity of the barrel is about 10 to 15 cubic feet of work, representing approximately 1000-pounds of castings, depending upon the type and size and nature of the work. The barrel revolves at 30 degrees from the horizontal.

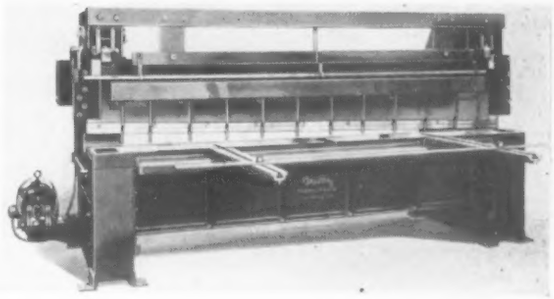
♦ ♦ ♦

Plate Shear—Beatty Machine & Mfg. Co., Hammond, Ind., recently placed on the market a shear, shown herewith, of all-steel construction with all working parts fully enclosed. In addition to the unique arrangement, the unit provides instantaneous cutting action at the touch of a button, for single piece cutting or for continuous cutting.

No flywheel is employed. The simple push-button has also eliminated the use of a foot treadle. Thus safety is an outstanding characteristic. A feature is the fact that the gap or throat of the shear cannot expand during splitting operations, it is claimed.

In this shear the vertical thrust is taken by a heavy pin and is located behind the gap or throat instead of directly over it. Transverse deflection is also impossible, according to the manufacturer. Another advantage is the clear view of the work which the machine affords. Large or small sheets may be sheared within full view of the operator at all times, and an adjustable rear squaring gage is provided with a range of 2 inches from the blade to any specified width.

BEATTY totally enclosed shear embodies rolled steel welded construction and steel castings. Delicate working parts have been eliminated

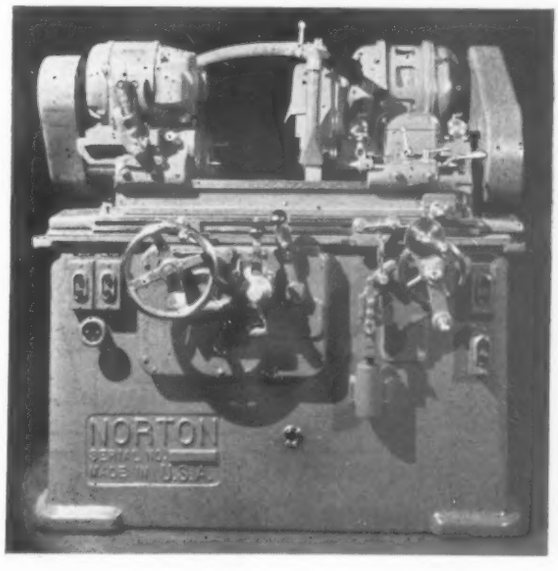


♦ ♦ ♦

Cylindrical Grinder—Norton Co., Worcester, Mass., announces the addition of a new cylindrical grinder to its type C line. The machine has a nominal swing of 6 inches and is built in either of two lengths taking 18 or 30 inches between centers. Patterned after the 10 and 16 inch type C machines announced earlier in the year this new 6 inch unit, shown herewith, has a self-contained wheel unit and uses a standard 20 inch diameter grinding wheel.

Work carriage consists of a sliding table traveling in a vee and a flat way in the base and which supports a swivel table pivoted to it at the center. The headstock, footstock, steady rest, center pointer and radial truing device are clamped to the swivel table. Headstock and footstock centers are larger. Footstock is lever operated, the length of both

HEADSTOCK of this Norton cylindrical grinder is driven by an adjustable speed direct-current motor with either a rheostat or drum controller to provide a wide range of work speeds. In addition, a lever which operates a clutch and brake is provided. The lever now is arranged vertically instead of horizontally, making operation easier



REX CHAIN

FOR EVERY DRIVE & CONVEYOR

FOR EVERY INDUSTRIAL USE . . .

REX

ROLLER CHAIN

The most highly finished chain on the market today for long service and low cost on high speed drives.

REX

CHABELCO CHAIN

A strong, long-wearing chain. Built with the famous Unit Link. For heavy duty drives at somewhat slower speeds—also in conveyor sizes.

REX

DUROBAR

An improved combination chain—the block link of either malleable or Rex Z-Metal—the latter the strongest, most wear-resisting metal cast in chain.

REX

GRIPLOCK

In malleable. The Griplock joint makes it a stronger chain—size for size and link for link—also cast in Z-Metal for longer, harder wear.

REX

UNICAST

The one-piece link—roller cast in place—makes it the most efficient malleable chain ever offered for eccentric loading on double strand conveyors.

REX

SNAKE CHAIN

A malleable chain that can flex in short radii in any direction—will help on many conveyor problems.

OTHER REX CHAINS

The Chain Belt Company also makes many other chains in malleable, Z-Metal, Steel and Combination for every type of service—and sprockets of all types—take-ups—set collars—buckets. Write on the type that interests you.

CHAIN BELT COMPANY
1660 W. Bruce St. MILWAUKEE, WIS.

CHAIN BELT COMPANY

CHAIN & BELT CONVEYING

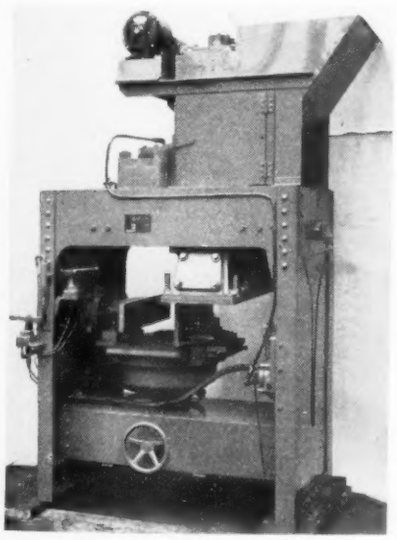
the lever and its handle having been increased to facilitate operation.

Power traverse machines are hydraulically propelled. Table speeds from 7 to 360 inches per minute are available. The table also can be moved by a handwheel which is automatically disconnected when the power traversing units are engaged. The quick-acting latches permit disconnecting the piston altogether, thus affording a means of operating the table by hand entirely independently of the hydraulic system.

For plunge-cut operations only, a hand traverse unit is substituted for the power traverse elements. Both hand and power traverse machines can be equipped with a hydraulically operated wheel head traverse unit. This unit moves the wheel head rapidly in and out between grinds for as much as 3 inches if required.

♦ ♦ ♦

Large Core Machines—Wm. Demmler & Bros., Kewanee, Ill., has introduced three large type core machines designed specially for automotive work. One machine is used for making cores for cylinder heads, manifolds, tappet housings, water jackets, cylinder and crank case sections, and transmission housings. This machine has a capacity sufficient to make cores for straight eight cylinder motor blocks. The unit is



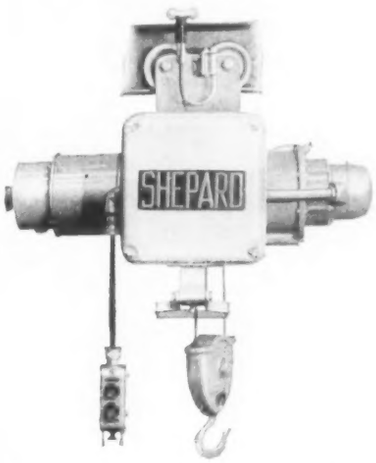
Demmler machine designed for eight cylinder automobile cores

equipped with a semi-automatic operating valve which controls the various operations of the machine in sequence. The unit is built on a structural frame which can be supplied in any desired height. The crosshead is of cast steel and has a large throat opening. The machine may be equipped with a motor driven and feeding device to provide a constant flow of sand.

A second machine, designed to do the same class of work, is built on a welded steel frame and the cylinders which move the sand magazine from filling to blowing position are enclosed in the frame. A motor driven sand feeding device is provided. The machine has a capacity of as high as 300 jacket cores per hour.

♦ ♦ ♦

Push Button Control—Shepard Niles Crane & Hoist Corp., 410 Schuyler avenue, Montour Falls, N. Y., recently introduced a selective 5-speed push button control for cranes and hoists. The five speeds are controlled from one button. The operator, increasing the pressure of



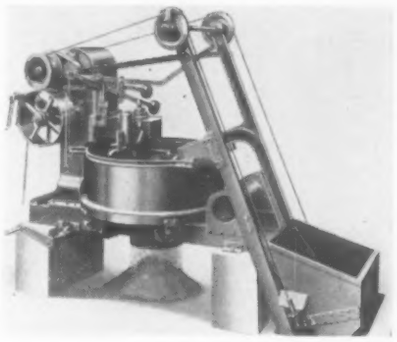
Shepard selective 5-speed push button control for hoists

his thumb, feels the change as each of the five independent speeds is obtained when the button is pressed or released. The first is a "creeping" speed. Each of the succeeding 4 speeds gives a gradual increase of torque. By releasing the button gradually the motor is slowed down through the same graduated speeds to a stop.

Where more than one motion is to be controlled—the movement of the crane bridge and the transverse motion of the trolley, as well as the lift of the hoist—individual push button controllers are provided for each of these operations. This control unit, shown herewith, is built in two sizes—class 1 and class A rated at 3 horsepower and 7½ horsepower respectively.

♦ ♦ ♦

Sand Mixer — Lancaster Iron Works Inc., Lancaster, Pa., has developed a line of mulling type units for mixing foundry core



Lancaster mulling-type unit for mixing core and molding sands

and molding sands. The mixer consists of a pan revolving in a clockwise direction, a mixing spindle with its mullers and plows revolving in a counter-clockwise direction and stationary marginal plows. The mixing spindle is eccentric to the pan. The height of the mullers can be adjusted off the pan.

In the mixing operation, the material in the pan is carried in a clockwise direction, at moderate velocity, until it meets the proportionately faster counter-clockwise rotation of the mixing spindle equipment. During the travel of the material permanent bottom and side marginal plows lift and turn the material or divert it into narrow troughs to be picked up again and turned and carried forward by the spindle. In addition, the manufacturers point out that many crossing-over points are established by the relative counter currents turning the material around its vertical axis and forcing the bottom layers to the top.

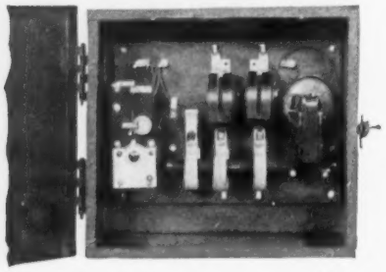
The batch can be fed directly into the pan or the unit may be loaded with a full batch stationary hopper or a full batch elevator hopper. The batch is discharged through a valve located in the center of the bottom of the pan. The mixing units may be fully enclosed.

♦ ♦ ♦

Welding Timer—General Electric Co., Schenectady, N. Y., recently introduced a new synchronous-motor-operated timer, type CR7993, for automatically timing the power supply to resistance welders by controlling the contactor on the welder. The new device, shown on page 50, eliminates human inaccuracy and guesswork, is easily and accurately set for the time most suitable for the work at hand, and, once set, the time is unaffected by line-voltage variations or surges.

Setting the timer to provide a given duration of welding current is accomplished by means of a gradu-

ated disk associated with the second projection on the timer motor shaft. A range of from 1/12 to 5/6 of a second in one-cycle steps (60-cycle supply) thus is available—a range suitable for all usual welding re-

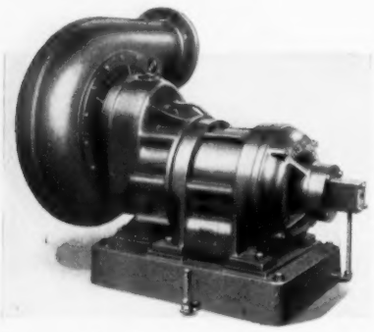


General Electric spot welding timer control panel

quirements. Longer welding times, up to five seconds, can be obtained by the use of a lower-speed timer motor. The new unit is furnished in several different forms.

♦ ♦ ♦

Geared Head Turbo-Blower—Allis-Chalmers Mfg. Co., Milwaukee, recently introduced a new compact centrifugal compressor or turbo-blower which utilizes a gearmotor. By using the gearmotor for speed increase, the blower can run at higher than motor speeds, thus reducing dimensions and improving performance. Pressures from 0.75 pound G. to 3.0 pound G. are developed, the volumetric capacities corresponding to motor outputs from 3 to 30 horsepower. The unit, shown herewith, may be used for



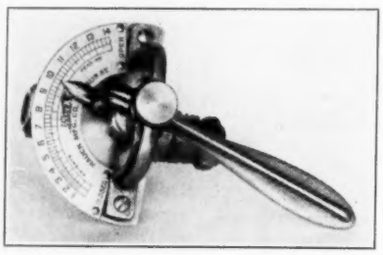
Geared head turbo-blower developed by Allis-Chalmers Mfg. Co.

foundry cupola blowing, oil and gas fired furnaces, pneumatic conveying, agitation and aeration, and for similar moderately low pressure air or gas supply services.

♦ ♦ ♦

Valve—Hauck Mfg. Co., 124 Tenth street, Brooklyn, N. Y., has brought out a new valve for minute regulation of fluid flow through small pipes. The unit, shown herewith, has an accurately and minutely variable orifice obtained by the movement of a rectangular slot in the tapered cup shaped portion of the valve stem as it rotates inside a stationary tapered collar and in which the collar has a long triangular or wedge shaped machine opening in circumferential position. As the valve stem is turned, the area of the opening may be increased or decreased by minute increments, or, if desired, can be opened full or shut instantly.

For oil burner operation, by moving the indicator from one graduation point to the next the rate of oil flow is closely regulated, thereby obtaining the desired temperature or atmosphere in a minimum time and these conditions can be duplicated at any time by resetting the valve at the previously indicated dial reading. The valve can be used for any grade of oil from the lightest distillates



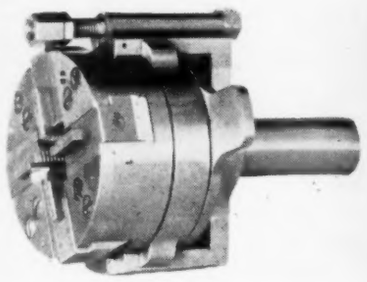
Hauck valve for minute regulation of fluid flow in small pipes

to the heaviest residues on any make of burner that requires oil regulation. Actual performance in heat treating, forging, annealing, steel making, metal melting, galvanizing, tinning, core baking, drying, baking, heating chemical and varnish process kettles, glass melting, ceramic kilns, boilers and other operations has revealed the merits of this valve.

♦ ♦ ♦

Insert Chaser Die Head—Eastern Machine Screw Corp., Truman and Barclay streets, New Haven, Conn., announces the development of a new style of H & G die head that uses inserted chasers for the No. 0 Brown & Sharpe automatic. The new head, shown herewith, is known as the No. 101 size of style DM. Every part on this die heat is hardened and ground. It is equipped with the well known but still further improved "double arm drive" shank which takes the torque at a maximum distance from the center, thus reducing friction of pull-off.

The unit is equipped with both adjustable pull-off trip and adjustable head and trip, the latter being especially advantageous on close to shoulder threading capacity range as follows:

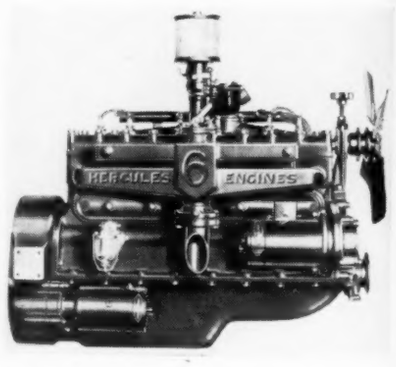


Insert chaser die head developed by Eastern Machine Screw Corp.

Up to and including ⅜-inch diameter with a thread length of 3⅜ inches; up to and including 9/16-inch diameter with a thread length of 1-1/16 inches; up to and including ¾-inch diameter with a thread length of 15/16 inches. Another unusual feature is that this die head which is only 2½ inches in diameter, uses the same chasers as the H & G insert chaser die heads used on the No. 2 B & S, ⅞-inch and 1¼-inch multiple spindle machines, etc.

♦ ♦ ♦

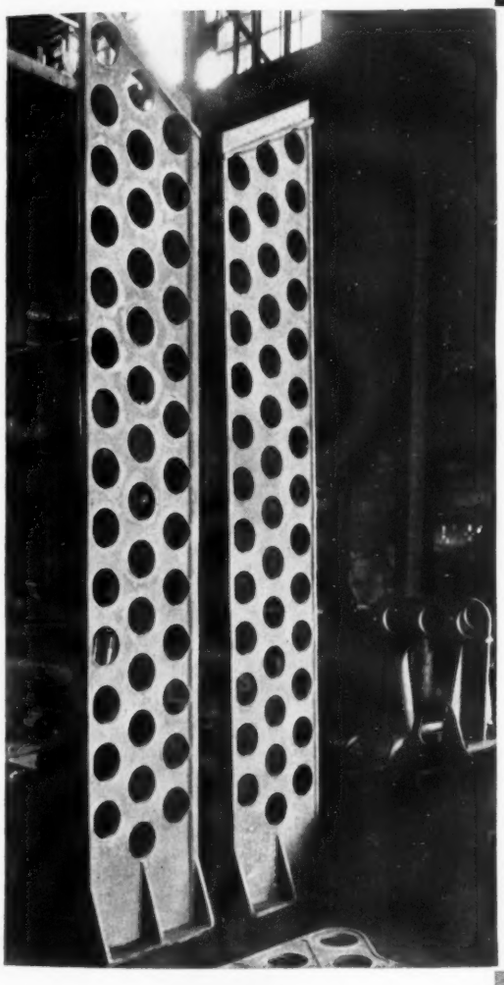
Six-Cylinder Gasoline Engine—Hercules Motors Corp., Canton, O., recently added a larger bore model to its JX series of six-cylinder gasoline engines. Applications of the unit, shown herewith, include oil field service and general industrial uses. This engine develops 83.8 horsepower at 2800 r. p. m. and 65.5 horsepower at 1800 r. p. m. with maximum torque of 204 foot pounds at 1000 r. p. m. A 2½-inch chrome molybdenum crankshaft is supported by seven bearings of the high lead bronze precision type. The cylinder and crankcase are cast integral of molybdenum alloy iron. Cylinder head is detachable. Aluminum alloy pistons are fitted with four rings.



Hercules gasoline engine meets industrial requirements

MIDVALE

HEAT AND CORROSION RESISTANT



ALLOYS

Complexities in today's manufacturing processes — increasing use of high temperatures under highly corrosive conditions — these and other factors necessitate constantly new qualities in the metal parts used.

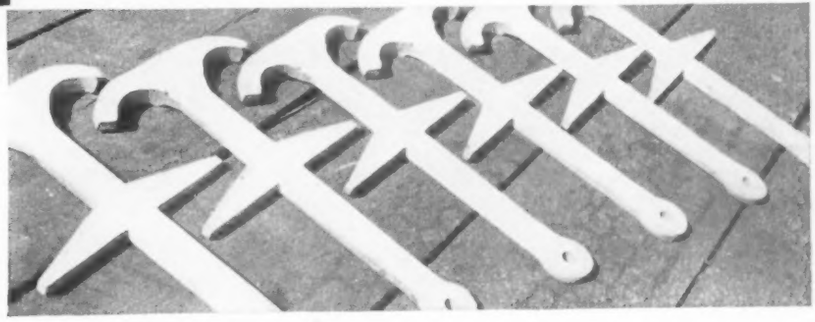
There never has been, and never will be, found one cure-all for all conditions. But Midvale *has* helped many an industry, and many a company, to solve *its* peculiar problem. Midvale pioneered in the first alloys in this country. Midvale is still helping industry in perfecting alloys that meet constantly new conditions.

Midvale welcomes an opportunity to help *you* solve your particular problem.

THE MIDVALE COMPANY

NICETOWN, PHILADELPHIA

Offices: NEW YORK—CHICAGO—PITTSBURGH
WASHINGTON—CLEVELAND—SAN FRANCISCO



Selecting Lubricants for Antifriction Bearings

(*Concluded from Page* 32)

film strengths of various types of lubricant which might be encountered, the Timken Roller Bearing Co. developed the Timken lubricant and wear testing machine, which has been helpful in obtaining data to help solve problems with which the company has been confronted. Straight mineral oils increase in film strength with increase in viscosity, and this machine demonstrates that fact. When dealing with extreme pressure lubricants, however, viscosity of the oil is of secondary consideration.

Lead, sulphur and chlorine have been the substances largely used thus far in compounding extreme pressure lubricants. Due to the difference in properties of these substances, it is likely that lubricants containing various combinations of these substances will prove best for different services. The Timken company is inclined to feel that more attention should be directed toward the use of definite chemical compounds, such as hexachlorethane, chlorinated retene, etc., instead of trying to sulphurize and chlorinate complex fats whose resultant product is variable and unknown.

It is realized that considerable work still remains to be done in the development of various types of lubricants to meet the advancing needs of antifriction bearings. The Timken organization constantly is conducting tests on suggested products, and co-operating with oil and grease manufacturers in an endeavor to solve the needs of the various fields in which its bearings are used.

Studies Properties of Low-Alloy Cast Steels

(*Concluded from Page* 37)

the same relative order as in salt water.

In hydrochloric acid solutions, Prof. Knight said the hand-puddled iron and the Roe iron losses were about the same for the bright specimens, while Byers-Aston iron was slightly higher. The specimens from which the mill scale had not been removed gave the highest loss for hand-puddled iron, with Roe and Byers-Aston irons almost the same and considerably lower than the hand-puddled iron.

In tap water, the losses were approximately the same for all three irons in both the bright specimens and those from which the mill scale was not removed. In the bright condition hand-puddled and Byers-Aston iron suffered the same loss, while with Roe iron the loss was slightly less. In the "as received" condition, the rate of loss for all three irons was nearly the same, with Roe iron suffering a slightly greater loss than the others.

Graphical method of calculating heat loss through furnace walls was described by Clarence E. Weinland, physicist, Johns-Manville Research Laboratories, Manville, N. J. In common with all graphical methods, the speaker declared, its accuracy is dependent directly on the size of the chart used, so that the accuracy of the known data may always be matched in accuracy of computation by proper choice of chart size. The important advantage of the graphical method is that solutions of accuracy sufficient for engineering use may be obtained quickly and surely, avoiding lengthy computations, Mr. Weinland concluded.

New Trade Publications

PUMPS—High-duty vacuum pumps for suction rolls and flat boxes are described in bulletin No. 50-B11 by the Roots-Connersville Blower Corp., Connersville, Ind.

GRINDERS—Electrically driven drills, grinders, buffers and flexible shaft machines are described and illustrated in a catalog by the United States Electrical Tool Co., Cincinnati.

FURNACES—General Electric Co., Schenectady, N. Y., has published a bulletin on its line of controlled-atmosphere electric furnaces for annealing, normalizing, brazing and hardening.

TEST PLIERS—Star Fuse Co. Inc., 235 Canal street, New York, has published a bulletin describing its test pliers which may be used to give an indication if there is current in the line.

EXTENSION REELS — Cincinnati Specialty Mfg. Co., 1907 Powers street, Cincinnati, has published several bulletins on its automatic extension reel for electric lamps, portable drills, grinders, etc.

WELDING EQUIPMENT—Alexander Milburn Co., 1416 West Baltimore street, Baltimore, has published a catalog covering its line of cutting and welding torches, pressure regulators, pressure gages, adaptors and manifolds, and other accessories and supplies.

STOKERS—Whiting Corp., underfeed stoker division, Harvey, Ill., has published a bulletin on the application of its stoker to the baking of cores in the foundry. In addition to the discussion of the features of such an application, illustrations show the method of installation.

POWER SHOVELS—Bucyrus-Erie Co., South Milwaukee, Wis., has issued a booklet dealing with the specifications for the various units in its extensive line of excavating machinery, cranes, linings, hoists, jacks and blowers. The publication is illustrated with numerous installation photographs.

PYROMETERS—Russell Electric Co., 340 Huron street, Chicago, has published a folder on its line of pyrometers for industrial use, including coremaking, heat treating, die casting and annealing. Information includes features of design especially applicable to certain installations.

DIAMOND WHEELS—Norton Co., Worcester, Mass., has published an attractive folder on its bortz (diamond) wheels for grinding and lapping cemented carbides. The text presents the story of that type of wheel, and the operations for which it may be used to greatest advantage. Diagrams show the available shapes and sizes.

RESEARCH—A booklet has been prepared by the Battelle Memorial institute, Columbus, O., illustrating and describing the work of that organization in relations to industry. Reproductions of photographs show the building and industrial laboratory, foundry, physics and metallographic laboratories, chemical laboratory and numerous other departments.

CEMENTED CARBIDE — Thomas Prosser & Son, 15 Gold street, New York, has issued a handbook and catalog of its Widia cemented carbides. It covers method of manufacture, characteristics, advantages of use, grades available, recommendations for use, tool design, applications, grinding procedure and brazing instructions. It is well illustrated.

OVEN HEATER — Willsea Works, 1042 University avenue, Rochester, N. Y., has published a folder describing the economies of its controlled heater with thermo syphon heat convection for automatically controlled foundry ovens. Construction of the heater, which may be used for core or mold ovens, is described and the method of controlling the heat is discussed.

COLD-FINISHED BARS — LaSalle Steel Co., Palmolive building, Chicago, has prepared a bulletin on its cold-finished steel bars marketed as "structured" bars. By this is meant steel of uniformity from lot to lot and from heat to heat, assured by the technique of control exercised in its making, rolling and drawing. Variations in structural characteristics are shown in photomicrographs as supplements to the text.

ELECTRIC MELTING — Detroit Electric Furnace Co., 825 West Elizabeth street, Detroit, has published a booklet entitled "Revenue From Electric Metal." The text includes discussions of what utilities are doing to develop electric melting, the reasons for electric melting, and the features of the rocking electric furnace made by that company. The discussion has been prepared primarily for utility men.

TIN PLATE—Under the name "Ductillite," Wheeling Steel Corp., Wheeling, W. Va., in a current booklet, describes its method of cold rolling steel sheets for the production of an improved tin plate. A second unit for this operation is being built to meet demand. Illustrations comprise a series of advertising layouts. The text explains advantages in the use of the new product. The cover, of blue and silver, presents a handsome dress.

Holiday Checks Ingot Rate; Mills Are Busier

Raw Steel Output Dips to 28 Per Cent—Sheets Up 10 Points as Automotive Buying Expands—Scrap in Sharp Rise—21,000 Tons of Piling Placed

INTERRUPTING steelworks operations last week, holiday influences reduced the national average 1 point to 28 per cent.

The extent of the rebound this week is expected to indicate whether operations will resume the slow but steady rise, which began with the third week in October, or merely hold their own until Christmas week. In three major districts substantial gains are scheduled.

Except for Thanksgiving day suspensions, sheet mills last week were operating at 40 per cent, 10 points above the preceding period, and tin plate production was up 5 points to 45 per cent. Some sheet and strip mills working on automobile orders experienced the second week of continuous schedules, for the first time since June.

To iron and steel producers, the chief significance in recent expansion in consumer commitments is that it has developed without any artificial influence such as preceded practically every other improvement since the steel code went in effect. Stocks are at an irreducible minimum, prices are unchanged for first quarter, and demand apparently is gaining momentum. On further consumer buying, scrap prices have advanced to their highest level in five months.

Despite the confusion prevailing at Washington between the left and right wings in administration affairs, the belief prevails that whether further impetus comes through private or government initiative, or co-operative movement, the position of the durable goods industries is to be measurably enhanced.

Van Sweringen Lines To Buy 100,000 Tons of Rails; Santa Fe Inquiring for 31,392 Tons

From now on automobile steel commitments are expected to increase more rapidly, manufacturers swinging into production on new models, with Chrysler in the lead and placing the largest steel orders.

At the moment railroad buying is at low ebb, but the carriers are formulating 1935 budgets. Three Van Sweringen lines will purchase 100,000 tons of rails. Santa Fe's expenditures will be two and a half times those of 1934, and this road already is in the market for 31,392 tons of rails and fastenings. Lehigh Valley is expected to release shortly more than 500 tons of steel for car repairs.

Structural shape awards for the week increased to 32,175 tons from 25,385 tons in the preceding week, with 21,000 tons of piling placed for the government dam at Grand Coulee, Wash. This is reported to be the largest single purchase of steel piling ever made in this country.

American Bridge Co. has started to fabricate 17,000 tons of structural shapes for building No. 6 in Radio City, New York, released on a contract for about 100,000 tons placed several years ago.

In the pig iron market the most conspicuous feature is the gain in orders from heating apparatus and sanitary ware manufacturers, whose production has increased to the highest level in several years through co-operation with the government's home renovizing program.

Scrap Accounts for Major Loss in Exports; Russia Ready To Close for Rolling Mills

October iron and steel exports—220,209 tons—were 81,121 tons less than in September. Scrap shipments accounted for most of this loss, dropping 77,999 tons. For ten months exports are 2,250,846 tons, 125 per cent larger than in the first ten last year.

Further expansion in the British iron and steel markets contrasts with lagging markets on the Continent, according to STEEL's London cablegram. British rail mills booked substantial orders for South America. Russia is buying more steel in Poland.

Early solution of financing difficulties with Russia is expected to result in the release of several rolling mills at Pittsburgh, for which the Russians long have been negotiating. A Pittsburgh builder closed last week for a rolling mill for Japan. A New York exporter has booked a large order for ship steel, mainly plates, for an undisclosed European interest.

Steelworks operations last week increased ½-point to 33½ per cent at Chicago, and 2½ to 27½ at Birmingham. They dropped 1 point to 20, Pittsburgh; 1½ to 18½, eastern Pennsylvania; 8 to 47, New England. Wheeling was unchanged at 54, Buffalo 24, Cleveland 46, Detroit 48, and Youngstown 35.

STEEL's iron and steel price composite, reflecting the advance in scrap, is up 4 cents to $32.22; the finished steel composite remains $54, while the scrap index is up 25 cents to $10.29.

COMPOSITE MARKET AVERAGES

	Dec. 1	Nov. 24	One Month Ago Nov., 1934	Three Months Ago Sept., 1934	One Year Ago Dec., 1933	Five Years Ago Dec., 1929
Iron and Steel Composite	$32.22	$32.18	$32.15	$32.15	$31.01	$35.43
Finished Steel Composite	54.00	54.00	54.00	54.00	51.10	56.33
Steelworks Scrap Composite	10.29	10.04	9.82	9.45	10.12	13.73

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip and cast iron pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	Dec. 1, 1934	Nov. 1934	Sept. 1934	Dec. 1933
Finished Material				
Steel bars, Pittsburgh	1.80	1.80	1.80	1.75
Steel bars, Chicago	1.85	1.85	1.85	1.80
Steel bars, Philadelphia	2.09	2.09	2.09	2.04
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.60
Shapes, Pitsburgh	1.80	1.80	1.80	1.70
Shapes, Philadelphia	2.00½	2.00½	2.00½	1.90½
Shapes, Chicago	1.85	1.85	1.85	1.75
Tank plates, Pittsburgh	1.80	1.80	1.80	1.70
Tank plates, Philadelphia	1.98½	1.98½	1.98½	1.88½
Tank plates, Chicago	1.85	1.85	1.85	1.75
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.75
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.25
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	2.85
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.85
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.35
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	2.95
Plain wire, Pittsburgh	2.30	2.30	2.30	2.20
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.60	2.60	2.60	2.35
Semifinished Material				
Sheet bars, open-hearth, Youngs.	$28.00	28.00	28.00	26.00
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	26.00
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	26.00
Wire rods, Pittsburgh	38.00	38.00	38.00	36.00

	Dec. 1, 1934	Nov. 1934	Sept. 1934	Dec. 1933
Pig Iron				
Bessemer, del. Pittsburgh	19.76	19.76	19.76	19.26
Basic, Valley	18.00	18.00	18.00	17.00
Basic, eastern, del. eastern Pa.	19.76	19.76	19.76	18.76
No. 2 foundry, del. Pittsburgh	19.26	19.26	19.26	18.76
No. 2 foundry, Chicago	18.50	18.50	18.50	17.50
Southern No. 2, Birmingham	14.50	14.50	14.50	13.50
No. 2X eastern, del. Philadelphia	20.63	20.63	20.63	19.63
Malleable, Valley	18.50	18.50	18.50	17.50
Malleable, Chicago	18.50	18.50	18.50	17.50
Lake Superior charcoal, del. Chi.	24.04	24.04	24.04	23.54
Gray forge, del. Pittsburgh	18.63	18.63	18.88	18.38
Ferromanganese, del. Pittsburgh	89.79	89.79	89.79	87.24
Scrap				
Heavy melting steel, Pittsburgh	$11.75	11.15	10.75	12.20
Heavy melt. steel, No. 2 east. Pa.	8.75	8.35	8.00	8.25
Heavy melting steel, Chicago	9.50	9.10	8.65	9.00
Rails for rolling, Chicago	10.75	10.35	10.05	10.35
Railroad steel specialties, Chicago	10.75	10.05	9.80	10.50
Coke				
Connellsville, furnace, ovens	3.60	3.60	3.60	3.75
Connellsville foundry, ovens	4.60	4.60	4.60	4.25
Chicago, by-product foundry, del.	9.25	9.25	9.25	9.25

Steel, Iron, Raw Material and Metals Prices

Prices conform to American Iron and Steel institute schedules. Asterisk denotes price change this week.

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.85c
Gary, base	1.95c
Chicago, del.	1.98c
New York, del.	2.18c
Philadelphia, del.	2.14c
Birmingham, base	2.00c
St. Louis, del.	2.17c
F.o.b. cars, dock, Pacific ports	2.40c

HOT ROLLED ANN. No. 24

Pittsburgh, base	2.40c
Gary, base	2.50c
Chicago, del.	2.53c
Detroit, del.	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham, base	2.55c
St. Louis, del.	2.72c
F.o.b. cars, dock, Pacific ports	3.05c

GALVANIZED No. 24

Pittsburgh, base	3.10c
Gary, base	3.20c
Chicago, del.	3.23c
Philadelphia, del.	3.39c
New York, del.	3.43c
Birmingham, base	3.25c
St. Louis, del.	3.42c
San Francisco, f.o.b. cars, dock	3.70c

TIN MILL BLACK No. 28

Pittsburgh, base	2.75c
Gary, base	2.85c
St. Louis, del.	3.07c

COLD ROLLED No. 10

Pittsburgh, base	2.50c
Gary, base	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.79c
New York, del.	2.83c
F.o.b. cars, dock, Pacific ports	3.10c

COLD ROLLED No. 20

Pittsburgh, base	2.95c
Gary, base	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.24c
New York, del.	3.28c

ENAMELING SHEETS

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh. Gary base, 10 cents higher.

Tin plate, coke base contract	$5.25
Do., stock	$4.90
Long ternes, No. 24 unassorted	3.40c

Corrosion and Heat Resistant Alloys

Pittsburgh, base, cents per lb.

	Chrome-Nickel No. 302	Chrome-Nickel No. 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold strip	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh, base	1.80c
New York, del.	2.08c
Philadelphia, del.	1.98½c
Boston, del.	2.20c
Buffalo, del.	2.03½c
Chicago or Gary base	1.85c
Cleveland, del.	1.98½c
Birmingham, base	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific Coast, f.o.b. cars, dock	2.25c
St. Louis, del.	2.07c

Structural Shapes

Pittsburgh, base	1.80c
Philadelphia, del.	2.00½c
New York, del	2.05¼c
Boston, del.	2.18½c
Bethlehem, base	1.90c
Chicago, base	1.85c
Cleveland, del.	1.98½c
Buffalo, base	1.90c
Gulf ports	2.20c
Birmingham, base	1.95c
Pacific Coast, f.o.b. cars, dock	2.35c

Bars

SOFT STEEL

Pittsburgh, base	1.80c
Chicago or Gary	1.85c
Duluth, base	1.95c
Birmingham, base	1.95c
Cleveland, base	1.85c
Buffalo	1.90c
Detroit, del.	1.95c
Pacific Coast ports cars, dock, c.i.f.	2.35c
Philadelphia, del.	2.09c
Boston, del.	2.20c
New York, del.	2.13c
Pitts., forg. qual.	1.95c-2.05c

RAIL STEEL
To Manufacturing Trade

Pittsburgh, base	1.70c
Chicago or Gary, base	1.75c
Moline, Ill., base	1.75c
Cleveland, base	1.75c
Buffalo, base	1.80c

IRON

Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia, base	1.89c
Pittsburgh, refined	2.75c-7.50c

REINFORCING

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo Cleve., Birm., Young	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.34c

Rail Steel

Straight lengths quoted by distributors

Pittsburgh, base	1.90c
Chicago, Buffalo, Cleveland, Birm., Young	1.95c
Gulf ports	2.30c

Wire Products □ □

(Prices apply to straight or mixed carloads; pool cars, or less, 10c up. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pitts.-Cleve. 100 lb. keg

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
Do., 16 gage and finer	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting □ □

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs. and over	1.97½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot) □

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni. 1.05
5100 0.80-1.10 Cr. 0.45
5100 Cr. spring ..... base
6100 bars 1.20
6100 spring 0.70
Cr., Ni., Van. 1.50
Carbon Van. 0.95
9250 ..... Carbon base plus extras

Piling □ □

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops □

Hot strip to 23⅛-in.

Pittsburgh	1.85c
Chicago, base	1.95c
Birmingham base	2.00c
Detroit, delivered	2.05c
Phila., delivered	2.14c
New York, del.	2.18c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip, Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material □

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 24-45 lbs.	$27.00
50-60 lbs.	$24.00
70-75 lbs.	$18.00
80-85 lbs.	$25.00
100 lbs.	$26.00
Light rails, billet qual. Pitts., Chi.	$35.00
Do., reroll. qual.	$34.00
Angle bars, mills	2.55c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs. up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	70-10-10-10 off
Rolled thread, ½ x 6 and smaller	70-10-10-10 off

MACHINE BOLTS

All sizes, cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts, without nuts	70-10-10-10 off
Tire bolts	60-10-10 off
Stove bolts, 75 off in pkgs.; 83 off in bulk, 15,000 or more of a size.	
Rolled thread machine bolts, ½ x 6 and smaller	70-10-10-10 off
Step bolts	70-10-10-10 off
Elevator bolts	70-10-10-10 off

NUTS

S.A.E. semifinished hex.; ½ to ⅞-inch	70-10-10-10 off
Do., ½ to 1-inch	75 off
Do., over 1-inch	70-10 off

HEXAGON CAP SCREWS

Milled	85 off
Upset, 1-in., smaller	85-10 off

SQUARE HEAD SET SCREWS

Upset, 1-in., small	80 off
Headless set screws	75-10 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila.	6.00 off

Cut Nails □ □

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads, Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

Steel

In.	Blk.	Gal.
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

Steel

2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

LINE PIPE

Steel

½, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63

Iron

⅛—1½-inch, black and galv. take 4 pts. over; 2½—6-inch 2 pts. over discounts for same sizes, standard pipe lists. 8—12-inch, no extra.

BOILER TUBES

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 2000 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 pounds, two points under base only.

SEAMLESS BOILER TUBES

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing □

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe □

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$38.00-39.00
4-in., Birmingham	41.00-42.00
4-in., Chicago	49.00-50.00
6 to 24-in., Chicago	46.00-47.00
6-in. & over, east fdy.	42.00
Do., 4-in.	45.00

Class A pipe $2 over Class B.

Stnd. fitgs., Birm. base	$100.00

Semifinished Steel □

BILLETS AND BLOOMS

4 x4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$27.00
Philadelphia	32.30
Duluth	31.00
Forging, Pitts., Chi. and Buffalo	32.00
Forging, Duluth	36.00

SHEET BARS

Pitts., Cleve., Young., Chi., Buff., Canton, O., and Sparrows Point, Md.	28.00

SLABS

Pitts., Cleve., Young.	27.00

WIRE RODS

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

SKELP

Pitts., Chicago	1.70c

Coke □ □ □

Price Per Net Ton

BEEHIVE OVENS

Connellsville, fur.	$3.60- 3.85
Connellsville, fdry.	4.60
Connell. prem. fdry.	5.10
New River fdry.	6.00
Wise county fdry.	4.45- 5.25
Wise county fur.	4.00- 4.50

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	11.00
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.50
Philadelphia, del.	9.00

Coke By-Products □

Per gallon, producers' plants.

Tank lots

	Spot
Pure benzol	19.00c
90 per cent benzol	19.00c
Toluol	30.00c
Solvent naphtha	26.00c
Commercial xylol	26.00c

Per lb. f.o.b. New York

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

†Naphthalene flakes and balls, in bbl.	5.50c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25; 50-cent differentials apply to any grade below 1.75. Gross tons.

BASING POINTS:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del.	14.50	.....	13.50	19.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Granite City, Ill.	18.50	18.50	18.00	.....
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
DELIVERED FROM BASING POINTS:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.02	.....	19.90	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.77	22.27	.....	.....
Brooklyn, N. Y., from Bmghm.	21.39	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham	19.13	.....	19.01	.....
Cleveland from Birmingham	18.62	.....	18.50	.....
Indianapolis from Hamilton, O.	20.77	20.77	20.27	21.27
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.50	19.50	19.00	20.00
Muskegon, Mich., from Chicago, Toledo or Detroit	21.40	21.40	20.90	21.90
Newark, N. J., from Birmingham	20.51	.....	.....	.....
Newark, N. J., from Bethlehem	20.89	21.39	.....	.....
Philadelphia from Birmingham	19.88	.....	19.76	.....
Philadelphia from Swedeland, Pa.	20.26	20.76	19.76	.....
Pittsburgh district from Neville Island	(Neville Island base, plus 63c, 76c and $1.13 switching chgs.)			
Saginaw, Mich., from Detroit	20.60	20.60	20.10	21.10
St. Louis from Granite City, Ill.	19.00	19.00	18.50	.....
St. Louis from Birmingham	18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

LOW PHOS.

Basing Points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$23.50. Basing Point: †Johnson City, Tenn.—$23.50

†Off grade material is $19.50

Philadelphia, standard and copper bearing 24.63

GRAY FORGE		CHARCOAL	
Valley furnace	18.00	Lake Superior fur.	21.00
Pitts. dist. fur.	18.00	Do., del. Chicago	24.04

SILVERY†

Jackson County, O., base; 6%—$22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices $1.25 higher.

BESSEMER FERROSILICON†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess	4.65

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. & low phos.	9.50
Swedish basic, 65%	9.00
Swedish low phos...	9.50
Spanish No. Africa basic, 50 to 60%....	9.00
Tungsten, spot, sh. ton unit, duty pd.	$17.75-18.25
N. F. fdy., 55%.....	7.00
Chrome ore, 48% gross ton, c.i.f.....	$18.00

Manganese Ore

(*Nominal*)

Prices, not including duty, cents per unit cargo lots.

Caucasian, 52-55%..	26.00
So. African, 52%.....	26.00
So. Afr., 49-51%.....	24.00
Indian, 58-50%	nominal
Indian, 48-50%	nominal

Refractories

Per 1000 f.o.b. Works

FIRE CLAY BRICK

First Quality

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	45.00

Second Quality

Pa., Ill., Ky., Md., Mo., Ga., Ala.	40.00

Ohio

First quality	$40.00
Intermediary	36.00
Second quality	25.00

MALLEABLE BUNG BRICK

All bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet, E. Chicago....	54.00
Birmingham, Ala.....	52.00

MAGNESITE

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases	40.00
Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash.	22.00

BASIC BRICK

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Magnesite brick	$65.00
Chrome brick	45.00
Chemically bonded magnesite	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$19.50
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$15.50-16.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base...	85.00
Do., del. Pittsburgh	89.79
Spiegeleisen, 19-20% dom. fur. spot†	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload..	85.00
Do., 75 per cent....	126-130.00

Spot, $5 a ton higher.

Silicomang., 2½ carb. 2% carbon, 95.00; 1%,	90.00 105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont.. on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
Do., under 1 ton..	7.50
Ferrophosphorus, per ton, c. l., 17.-19% Rockdale, Tenn., basis, 18%, $2 unitage	42.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	55.00
Ferromolybdenum, stand. 50-60%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply.

Nonferrous Mill Products

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 9.00c Conn. copper

Sheets

Yellow brass (high)	14.50
Copper, hot rolled...	16.00
Lead, cut, to jobbers	7.50
Zinc, 100-lb. base....	9.50

Tubes and Pipes

High yellow brass..	17.00
Seamless copper.....	17.25

Rods

High yellow brass..	13.00
Copper, hot rolled...	13.25

Anodes

Copper, untrimmed	13.75

Wire

Yellow brass (high)	15.00

Old Metals

Deal, buying prices, cents lb.

No. 1 Composition Red Brass

*New York	4.12½-4.37½
Chicago	4.25- 4.50
*Cleveland	4.75- 5.00
St. Louis	4.25- 4.50

Heavy Copper and Wire

New York	5.50- 5.75
Chicago, No. 1	5.50- 5.75
*Cleveland	5.00- 5.25
St. Louis	5.00- 5.25

Composition Brass Borings

*New York	3.75- 4.00

Light Copper

New York	4.37½-4.62½
Chicago	4.12½-4.37½
*Cleveland	4.00- 4.50
St. Louis	4.25- 4.50

Light Brass

Chicago	2.12½-2.37½
Cleveland	2.25- 2.50

Lead

New York	2.65- 2.75
*Cleveland	2.50- 2.75
Chicago	2.50- 2.62½
St. Louis	2.75- 2.85

Zinc

New York	1.75- 2.00
*Cleveland	1.50- 1.75
St. Louis	2.50- 2.60

Aluminum

Borings, Cleveland	6.00- 6.50
*Mixed, cast, Cleve.	11.00-11.50
Mixed, cast, St. L.	11.00-11.50
*Clips, soft, Cleve....	12.50-13.00

Secondary Metals

Brass ingot, 85-5-5-5	8.25
Stand. No. 12 Alum.	15.00

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.00- 8.50
Boston, dock, expt.	8.00- 8.25
Buffalo, No. 1	9.75-10.25
Buffalo, No. 2	8.75- 9.25
Chicago, No. 1	9.25- 9.75
Cleveland, No. 1	9.00- 9.50
Cleveland, No. 2	8.50- 9.00
Detroit, No. 1	7.75- 8.25
Detroit, No. 2	6.75- 7.25
Eastern Pa.	10.50
Eastern Pa., No. 2	8.50- 9.00
Federal, Ill.	7.00- 7.50
Granite City, R. R.	8.00- 8.50
Granite City, No. 2	6.50- 7.00
N. Y., deal. No. 2	7.00
N. Y., deal. R. R.	8.50
Pittsburgh, No. 1	11.50-12.00
St. Louis	7.00- 7.50
Valleys, No. 1	11.00-11.50

COMPRESSED SHEETS

Buffalo, dealers	8.75- 9.25
Chicago, factory	8.25- 8.75
Cleveland	9.00- 9.50
Detroit	7.75- 8.25
E. Pa., new mat.	9.50-10.00
Pittsburgh	11.50-12.00
St. Louis	5.50- 6.00
Valleys	10.50-11.00

BUNDLED SHEETS

Buffalo	6.50- 7.00
Cincinnati, del.	6.00- 6.50
Cleveland	7.00- 7.50
Pittsburgh	10.00-10.50
St. Louis	4.50- 5.00

SHEET CLIPPINGS, LOOSE

Chicago	5.00- 5.50
Cincinnati	5.00- 5.50
Detroit	4.50- 5.00
St. Louis	4.00- 4.50

STEEL RAILS, SHORT

Birmingham	10.50-11.00
Buffalo	11.75-12.25
Chicago (3 ft.)	11.00-11.50
Chicago (2 ft.)	12.50-13.00
Cincinnati, del.	10.25-10.75
Detroit	10.50-11.00
Pitts., open-hearth, 3 ft. and less	14.50-15.00
St. Louis, 2 ft. & less	10.50-11.00

STEEL RAILS, SCRAP

Boston	5.25- 5.50
Chicago	9.25- 9.75
Pittsburgh	11.75-12.25

STOVE PLATE

Birmingham	5.50- 6.00
Boston, dealers	3.25- 3.75
Buffalo	8.75- 9.00
Chicago, net	5.50- 6.00
Cincinnati, dealers	5.00- 5.50
Detroit, net	6.00- 6.50
Eastern Pa.	8.50
N. Y., deal. fdry.	6.00
St. Louis	5.50- 6.00

COUPLERS, SPRINGS

Buffalo	12.00-12.50
Chicago, springs	10.50-11.00
Eastern Pa.	13.00-13.50
Pittsburgh	14.50-15.00
St. Louis	8.50- 9.00

ANGLE BARS—STEEL

Chicago	10.25-10.75
St. Louis	8.00- 8.50

RAILROAD SPECIALTIES

Chicago	10.50-11.00

LOW PHOSPHORUS

Buffalo, billets and bloom crops	11.50-12.00
Cleveland, billet, bloom crops	13.00-13.50
Eastern Pa., crops	13.50-14.00
Pittsburgh, billet, bloom crops	14.50-15.00
Pittsburgh, sheet bar crops	14.00-14.50

FROGS, SWITCHES

Chicago	9.25- 9.75
St. Louis, cut	8.50- 9.00

SHOVELING STEEL

Chicago	9.25- 9.75
Federal, Ill.	6.75- 7.00
Granite City, Ill.	6.00- 6.50

RAILROAD WROUGHT

Birmingham	7.00- 7.50
Boston, dealers	6.00- 6.50
Buffalo, No. 1	7.50- 8.00
Buffalo, No. 2	9.75-10.25
Chicago, No. 1, net	8.50- 9.00
Chicago, No. 2	9.25- 9.75
Cincinnati, No. 2	7.25- 7.75
Eastern Pa.	11.00-11.50
N. Y., No. 1, deal.	7.00- 7.50
St. Louis, No. 1	5.75- 6.25
St. Louis, No. 2	7.00- 7.50

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	8.50
New York, dealers	3.50- 4.00

BUSHELING

Buffalo, No. 1	8.75- 9.25
Chicago, No. 1	8.25- 8.75
Cinci., No. 1, deal.	6.00- 6.50
Cincinnati, No. 2	3.50- 4.00
Cleveland, No. 2	6.75- 7.00
Detroit, No. 1, new	6.75- 7.25
Valleys, new No. 1	10.25-10.75

MACHINE TURNINGS

Birmingham	4.50- 5.00
Boston, dealers	1.50- 1.75
Buffalo	4.75- 5.25
Chicago	4.50- 5.00
Cincinnati, dealers	4.00- 4.50
Cleveland	6.25- 6.75
Detroit	4.50- 5.00
Eastern Pa.	5.50- 6.00
New York, dealers	2.00- 2.25
Pittsburgh	8.50- 9.00
St. Louis	3.00- 3.50
Valleys	8.00- 8.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	5.50- 6.00
Cincinnati, dealers	4.00- 4.50
Cleveland	6.75- 7.00
Detroit	5.50- 6.00
Eastern Pa.	5.00
New York, dealers	1.50- 1.75
Pittsburgh	5.50- 6.00

CAST IRON BORINGS

Birmingham, plain	4.50- 5.00
Boston, chemical	8.50- 9.00
Boston, dealers	3.25- 3.50
Buffalo	5.50- 6.00
Chicago	5.25- 5.75
Cincinnati, dealers	4.00- 4.50
Cleveland	6.75- 7.00
Detroit	5.50- 6.00
E. Pa., chemical	12.00-13.00
New York, dealers	1.50- 1.75
Pittsburgh	5.00- 5.50
St. Louis	3.00- 3.50

PIPE AND FLUES

Cincinnati, dealers	4.00- 4.50

RAILROAD GRATE BARS

Buffalo	6.50- 7.00
Chicago, net	5.00- 5.50
Cincinnati	4.00- 4.50
Eastern Pa.	8.00- 8.50
New York, dealers	4.00- 4.50
St. Louis	4.50- 5.00

FORGE FLASHINGS

Boston, dealers	4.25- 4.50
Buffalo	8.50- 9.00
Cleveland	7.00- 7.50
Detroit	6.25- 6.75

FORGE SCRAP

Boston, dealers	3.75- 4.00
Chicago, heavy	10.50-11.00
Eastern Pa.	9.00- 9.50

ARCH BARS, TRANSOMS

St. Louis	10.50-11.00

AXLE TURNINGS

Boston, dealers	3.00- 3.50
Buffalo	7.00- 7.50
Chicago, elec. fur.	8.50- 9.00
Cleveland	6.00- 6.50
Eastern Pa.	9.00- 9.50
St. Louis	6.50- 7.00

STEEL CAR AXLES

Birmingham	10.00-10.50
Boston, ship. point.	10.00-10.50
Buffalo	12.00-12.50
Chicago, net	13.00-13.50
Eastern Pa.	14.00-15.00
St. Louis	11.25-11.75

SHAFTING

Boston, ship. point.	11.25-11.75
Eastern Pa.	16.00-16.50
New York, dealers	10.75-11.25
St. Louis	11.50-12.00

CAR WHEELS

Birmingham, iron	9.00- 9.50
Boston, iron deal.	5.00- 5.50
Buffalo, iron	11.00-11.50
Buffalo, steel	12.00-12.50
Chicago, iron	10.00-10.50
Chicago, rolled steel	10.50-11.00
Cincinnati, iron	8.00- 8.50
Eastern Pa., iron	10.50-11.00
Eastern Pa., steel	13.00-13.50
Pittsburgh, iron	11.00-11.50
Pittsburgh, steel	14.50-15.00
St. Louis, iron	7.25- 7.75
St. Louis, steel	8.75- 9.25

NO. 1 CAST SCRAP

Birmingham	8.50- 9.00
Boston, No. 2	6.00
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	9.50-10.00
Buffalo, mach.	10.75-11.25
Chicago, agri. net	8.00- 8.50
Chicago, mach. net	9.00- 9.50
Chicago, railroad net	8.50- 9.00
Cinci., mach. cup	8.50- 9.00
Cleveland, cupola	10.75-11.25
Detroit, net	8.50- 9.00
Eastern Pa., cupola	11.00-11.50
Pittsburgh, cupola	13.50-14.00
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	7.00- 7.50
St. L., No. 1 mach.	9.00- 9.50

HEAVY CAST

Boston, del.	5.00- 5.25
Buffalo, break.	8.00- 8.50
Cleveland, break.	8.00- 8.50
Detroit, break.	6.50- 7.00
Detroit, auto net	9.00- 9.50
Eastern Pa.	10.00
N. Y., break. deal.	6.00- 6.25
Pittsburgh	11.50-12.00

MALLEABLE

Boston, consum.	10.00-10.50
Buffalo	10.50-11.00
Chicago, R. R.	10.50-11.00
Cincinnati, agri. del.	7.50- 8.00
Cleveland, rail	11.00-11.50
Detroit, auto	8.75- 9.25
St. Louis, R. R.	8.00- 8.50
Eastern Pa., R. R.	10.50-11.00

RAILS FOR ROLLING

5 feet and over

Birmingham	9.50-10.50
Boston, dealers	8.00- 8.50
Buffalo	10.25-10.75
Chicago	10.50-11.00
Eastern Pa.	12.00-12.50
New York, dealer	7.50- 8.00
St. Louis	9.50-10.00

LOCOMOTIVE TIRES

Chicago (cut)	10.00-10.50
St. Louis, No. 1	10.00-10.50

LOW PHOS. PUNCHINGS

Buffalo	12.00-12.50
Chicago	11.50-12.00
Eastern Pa.	14.50-15.00
Pittsburgh	13.50-14.00

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper: Electro., del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Spot, N. Y.	Nickel Cathodes
Nov. 24	9.00	9.12½	7.37½	51.20	51.22½	3.50	3.35	3.67½	*19.00	13.00	35.00
Nov. 26	9.00	9.12½	7.37½	51.25	51.30	3.50	3.35	3.67½	*19.00	13.00	35.00
Nov. 27	9.00	9.12½	7.37½	51.25	51.30	3.50	3.35	3.67½	*19.00	13.00	35.00
Nov. 28	9.00	9.12½	7.37½	51.37½	51.42½	3.50	3.35	3.70	*19.00	13.00	35.00
Nov. 29—Holiday											
Nov. 30	9.00	9.12½	7.37½	51.20	51.25	3.50	3.35	3.70	*19.00	13.00	35.00

*Nominal range 19.00c to 21.00c.

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	□
Baltimore*	2.90c
Boston††	2.95c
Buffalo	3.00c
Chattanooga	3.31c
Chicago	2.95c
Cincinnati	3.15c
Cleveland	2.95c
Detroit	3.03½c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.30c
New York‡(d)	3.22c
Pittsburgh(h)	2.90c
Philadelphia*	2.90c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.19c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS	□
Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.00c
Chicago	2.75c
Cincinnati	3.15c
New York‡(d)	3.32c
Philadelphia*	2.90c
St. Louis	3.19c
Tulsa	3.25c

REINFORC. BARS	□
Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland(c)	1.97½c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.15c
New Orleans	3.50c
Pitts., plain(h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	3.50c
St. Louis	3.24c
Tulsa	3.25c
Young	2.30c-2.60c

SHAPES	□
Baltimore*	3.90c
Boston††	3.17c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland	3.31c
Detroit	3.40c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.55c
New York(d)	3.37c
Philadelphia*	2.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c

PLATES	□
Baltimore*	2.90c
Boston††	3.18c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland, ¼-in. and over	3.31c
Detroit	3.40c
Detroit, ⅜-in.	3.65c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.95c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE	□
Baltimore*	3.05c
Boston††	3.25c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.00c
Cincinnati	3.20c
Cleveland	3.11c
Det., 8-10 ga.	3.13½c
Houston	3.35c
Los Angeles	3.80c
New Orleans	3.55c
New York	3.27c
Portland	3.75c
Philadelphia*	3.05c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.29c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK	□
Baltimore*†	3.51c
Boston (g)	3.90c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4.05c
Cleveland	3.91c
Detroit	3.98½c
Los Angeles	4.45c
New York	3.85c
Philadelphia*†	3.55c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.09c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS	□
Baltimore*†	4.21c
Buffalo	4.00c
Boston (g)	4.60c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.70c
Cleveland	4.61c
Detroit	4.70c
Houston	4.40c
Los Angeles	5.05c
New Orleans	4.95c
New York	4.50c
Philadelphia*†	4.25c
Pitts.** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.79c
St. Paul	4.19c
Tulsa	5.10c

BANDS	□
Baltimore*	3.15c
Boston††	3.25c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.45c
Cleveland	3.36c
Detroit, ⅞-in. and lighter	3.38½c
Houston	3.25c
Los Angeles	3.90c
New Orleans	3.59c
New York(d)	3.62c
Philadelphia	3.15c
Pittsburgh(h)	3.20c
Portland	3.90c
San Francisco	4.05c
Seattle	3.90c
St. Louis	3.54c
St. Paul	3.20c
Tulsa	3.45c

HOOPS	□
Baltimore	2.30c
Boston	4.25c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.45c
Det., No. 14 and lighter	3.38½c
New York	3.62c
Philadelphia	3.40c
Pittsburgh(h)	3.70c
Seattle	5.60c
St. Louis	3.54c
St. Paul	3.75c

COLD FIN. STEEL	□
Baltimore (c)	3.71c
Boston	4.00c-4.50c
Buffalo (h)	3.55c
Chattanooga*	4.06c
Chicago (h)	3.50c
Cincinnati	3.70c
Cleveland (h)	3.50c
Detroit	3.63½c
Los Ang.(f)(d)	4.95c
New Orleans	4.30c
New York	3.92c-4.42c
Philadelphia	3.73c
Pittsburgh(h)	3.45c
Portland (f)	4.75c
San Fran.(f)(d)	5.95c
Seattle (f) (d)	4.75c
St. Louis	3.74c
St. Paul	3.20c
Tulsa	4.65c

COLD ROLL. STRIP	□
Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	3.39c
Chicago	3.27c
Cincinnati(b)	3.42c
Cleveland (b)	3.20c
Detroit	3.33c
New York	4.70c
St. Louis	3.36c

(b) Plus straightening, cutting and quantity differentials.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) 50 bundles or over.
(h) Outside delivery, 10c less.

‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.
†New extras apply.
††Base 40,000 lbs. extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, New York, Boston, St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Nov. 28

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

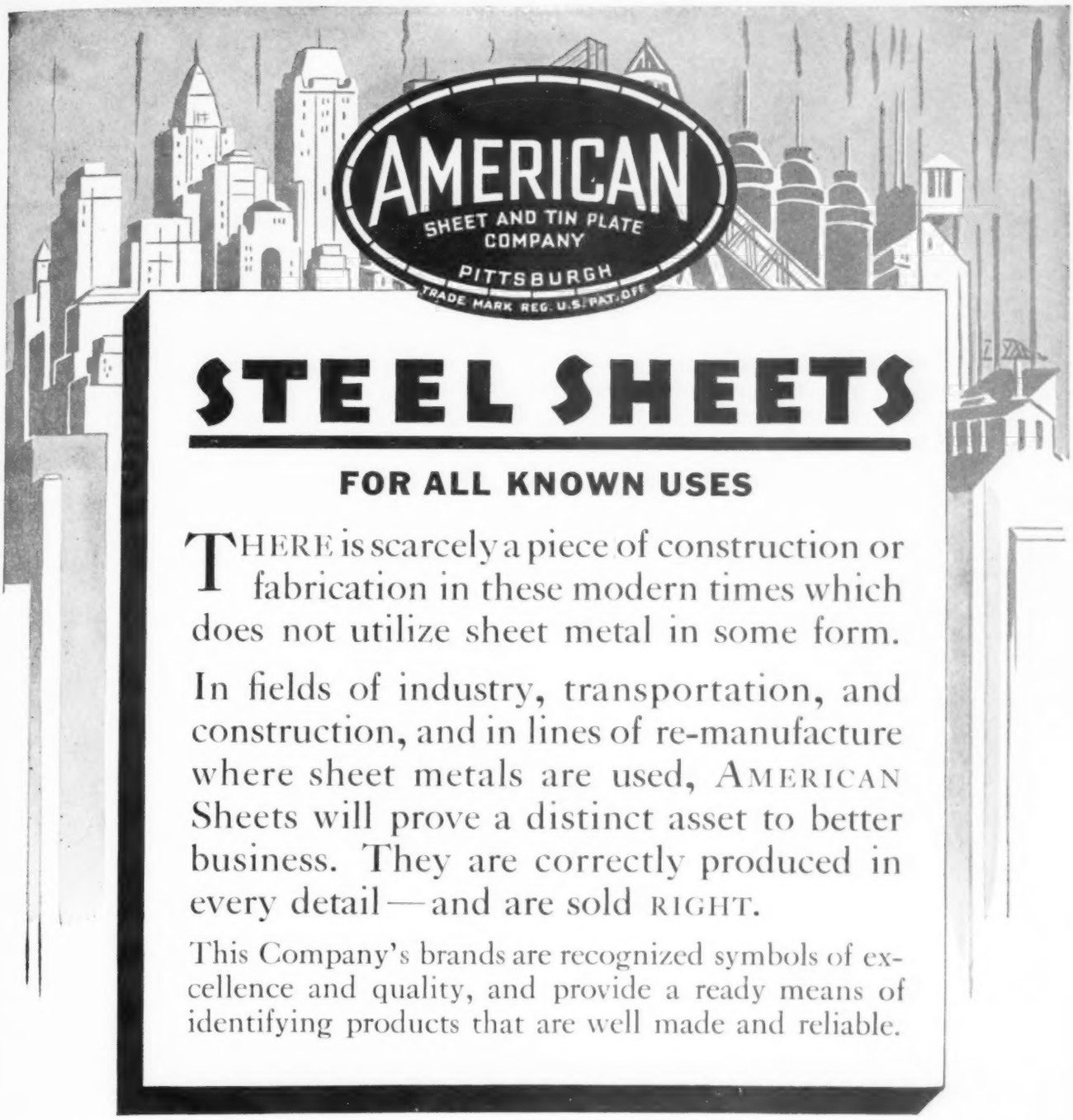
	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons	
PIG IRON	£ s d		Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Silicon	$15.34	3 1 6	$13.21	1 13 0
Basic bessemer	13.72	2 15 0*	12.41	1 11 0
Hematite, Phos. .03-.05	15.59	3 2 6	.....	.....
SEMIFINISHED STEEL				
Billets	$27.45	5 10	$18.85	2 7 0
Wire rods, No. 5 gage	38.92	7 16	36.08	4 10 0
FINISHED STEEL				
Standard rails	$38.67	7 15 0	$44.10	5 10 0
Merchant bars	1.67c	7 10 0	1.15c to 1.19c	3 2 6 to 3 5 0
Structural shapes	1.64c	7 7 6	1.12c	3 1 6
Plates, †¼ in. or 5 mm.	1.78c	8 0 0	1.50c	4 2 6
Sheets, black, 24 gage or 0.5 mm.	2.06c	9 5 0	2.11c	5 16 0
Sheets, gal., 24 gage, corr.	2.51c	11 5 0	2.36c	6 10 0
Bands and strips	1.90c	8 10 0	1.45c	4 0 0
Plain wire, base	2.06c	9 5 0	1.94c	5 7 6
Galvanized wire, base	2.51c	11 5 0	2.27c to 2.32c	6 5 6 to 6 7 6
Wire nails, base	2.68c	12 0 0	2.09c	5 15 0
Tin plate, box 108 lbs.	$ 4.49	0 18 2	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks	
Fdy. pig iron, St. 2.5	$16.84	3 7 6(a)	$13.84	210	$14.48	310	$25.33	63
Basic bessemer pig iron	16.84	3 7 6(a)*	12.19	185	12.61	270	27.94 (b)	69.50
Furnace coke	4.37	0 17 6	7.91	120	5.14	110	7.64	19
Billets	27.45	5 10 0	28.34	430	20.55	440	38.79	96.50
Standard rails	1.84c	8 5 0	2.08c	694	2.31c	1,100	2.40c	132
Merchant bars	1.91c	8 12 0	1.68c	560	1.16c	550	2.00c	110
Structural shapes	1.95c	8 15 0	1.65c	550	1.16c	550	1.96c	107.50
Plates, †¼-in. or 5 mm.	2.02c	9 1 3	2.10c	700	1.47c	700	2.31c	127
Sheets, black	2.34c	10 10 0§	2.55c	850‡	1.63c	775‡	2.62c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.90c	13 0 0	4.50c	1,500	3.15c	1,500	6.73c	370
Plain wire	2.06c	9 5 0	3.15c	1,050	2.31c	1,100	3.15c	173
Bands and strips	2.09c	9 7 0	1.95c	650	1.47c	700	2.31c	127

*Basic. †British ship-plates. Continental, bridge plates. 24 ga. ‡1 to 3 mm. basic price British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel a del. Middlesbrough. b hematite.
**Gold pound sterling carries a premium of 64.75 per cent over paper sterling.



STEEL SHEETS

FOR ALL KNOWN USES

THERE is scarcely a piece of construction or fabrication in these modern times which does not utilize sheet metal in some form.

In fields of industry, transportation, and construction, and in lines of re-manufacture where sheet metals are used, AMERICAN Sheets will prove a distinct asset to better business. They are correctly produced in every detail—and are sold RIGHT.

This Company's brands are recognized symbols of excellence and quality, and provide a ready means of identifying products that are well made and reliable.

AMERICAN products are sold by leading metal merchants. Write for full information on Black and Galvanized Sheets, Formed Roofing and Siding Products, Sheets for Special Purposes, Cold Rolled Sheets, Enameling Sheets, Electrical Sheets, Tin and Terne Plates — also U S S High Tensile Steel Sheets, and USS Stainless and Heat Resisting Steel Sheets and Light Plates. Literature describing these products will be sent upon request to nearest Sales Office.

American Sheet and Tin Plate Company

GENERAL OFFICES: Frick Building, PITTSBURGH, PA.

DISTRICT SALES OFFICES:

PITTSBURGH, PA., Frick Building — CHICAGO, ILL., 208 So. La Salle St. Building — NEW YORK, N. Y., 71 Broadway — DETROIT, MICH., General Motors Building
CINCINNATI, OHIO, Union Trust Building — DENVER, COLO., First National Bank Building — ST. LOUIS, MO., Mississippi Valley Trust Building
HOUSTON, TEX., Petroleum Building — PHILADELPHIA, PA., Widener Building — BIRMINGHAM, ALA., Brown Marx Building

Pacific Coast Distributors — COLUMBIA STEEL COMPANY, San Francisco, Calif. — *Export Distributors* — UNITED STATES STEEL PRODUCTS CO., New York, N. Y.

United States Steel Corporation Subsidiary

Bars

Bar Prices, Page 54

Pittsburgh—The steel bar market reflects only minor gains in specifications but reports that the agricultural implement industry is expecting the largest sales since 1930 and that the automotive industry plans at least a 3,000,000-car year in 1935 speak well for the bar market's prospects. Soft steel bars maintain their 1.80c, Pittsburgh market and the alloy base 2.45c, Pittsburgh. Clarification is expected in the near future in the long-existent problem of defining wire rods and merchant steel bars. It is expected that a solution will be worked out based on a sliding scale differentiation.

Cleveland—Specifications have improved slightly, mainly from automobile and agricultural implement manufacturers. A few miscellaneous orders also were received in the week from railroads. Nut and bolt manufacturers are obtaining larger releases from automobile interests, and are expected in the market shortly for bars. Producers report relatively few orders for merchant bars from miscellaneous manufactuing interests.

Chicago—Aided by further gains in automotive demand and by steady specifications from the farm implement industry and miscellaneous consumers, steel bar sales and specification are improving slowly. Activity recently has been at the best rate since June. Contracting for first quarter is started, with prices unchanged at 1.85c, base, for soft steel, 1.75c for rail steel and 1.80c for bar iron.

Boston—While bolt and nut makers, railroads and some larger consumers of commercial steel bars have not increased consumption materially, there has been a better miscellaneous demand. Bids are in on 223 tons of three-inch diameter nickel-steel bars for the Boston navy yard.

New York—Commercial bar contracting for next quarter is expected to get under way slowly with most consumers buying lightly. Consumers' stocks generally are low.

Philadelphia—Some leading bar sellers here look for improvement in railroad buying this month, it being understood that some railroad shops will begin work on new maintenance programs Jan. 1. General buying is light, with sellers endeavoring to get contracts lined up for first quarter. The market is 1.80c, Pittsburgh, or 2.09c, Philadelphia.

Philadelphia—Increased demand for small tools has been reflected in improved specifications for steel bars.

Plates

Plate Prices, Page 54

Pittsburgh—Application of small-lot quantity extras on plates, as well as on shapes, which had been proposed for adoption Dec. 1 and in effect Dec. 31 on shipments, gave indication late last week of being indefinitely suspended. Midland Barge Co., Midland, Pa., last week was announced low at $71,400 for a 120 x 44 x 8-foot whirler derrick boat for the Buffalo engineers. One-half-inch plates are required in the main for the 650 tons St. Louis Shipbuilding & Steel Co., St. Louis, needs to fabricate a welded 300 x 40 x 11-foot mooring barge for the Semet-Solvay Corp., Syracuse, N. Y. Valley Camp Coal Co., Cleveland, last week purchased four 100 x 26 x 9-foot used coal barges for Kanawha river use from a Pittsburgh concern. The plate market is steady and firm at 1.80c, Pittsburgh.

Cleveland—Among heavy finished steel products plates appear least in demand. Tank work is at a low ebb, and few structural projects requiring plates are pending. Small plate interests are protesting against mill quantity extras on less than 6000 pounds, first announced in September, then suspended, and recently announced to become effective on shipments after Dec. 31. One complaint is the extras entail an inordinate amount of figuring on quotations.

Boston—Plate volume is made up mainly of miscellaneous small lots with the recent rate barely maintained. Railroads are taking few plates. Boiler shop activity is spotty and there is a lack of large tank work. Slightly more than 1100 tons has been awarded for the Portsmouth, N. H., navy yard, also close to 100 tons of nickel-steel cutter blades for the city of Boston, the latter being placed through two jobbers.

San Francisco—The metropolitan water district, Los Angeles, has rejected all bids on the second unit of its aqueduct, involving 4100 tons of steel pipe and will readvertise. Awards during the week were confined to small lots. No new inquiries of size were reported.

New York—What is believed to be the largest order for ship steel, largely plates, for export from this country to Europe in considerable time has been closed by Otto Kafka Inc., exporter and importer, 2 Rector street. The purchaser of the steel was not identified. This award has proved of special interest, because of the lower labor costs which have prevailed on the other side, and which have made European steel mills strong competitors of American producers in recent years in world markets.

(Late Friday the American Iron and Steel institute advised there would be no suspension of the plate extras.)

Quantity extras on plates effective Jan. 1 may stimulate mildly specifications this month. However, larger consumers, including structural fabricators, shipbuilders and railroad equipment builders, continue to protest strongly. Current releases are fair.

Philadelphia—Plate sellers are figuring on an additional lot of 410 tons for the navy for work at Philadelphia yard. Black high tensile plates are specified. Meanwhile action is pending on most of the plates on which bids have been opened over the past month. The Sun Shipbuilding & Dry Dock Co., Chester, Pa., has closed on possibly 350 to 400 tons of plates, shapes and bars for repairs to a tanker for the Texas Co. The Reading Co. is expected to take action some time this month on plates for car repair work, about 800 tons. The market continues 1.90c, Coatesville, Pa., or 1.98½c, Philadelphia, which prices have been extended for first quarter.

Contracts Placed

650 tons, mainly ½-inch plates, one 300 x 40 x 11-foot mooring barge for Semet-Solvay Corp., Syracuse, N. Y., Louisiana coastal use, to St. Louis Shipbuilding & Steel Co., St. Louis.

100 tons, ferries for state highway department, Ryer, Calif; to General Engineering & Drydock Co., San Francisco.

Contracts Pending

5000 tons, 70 and 80-inch welded steel pipe, Malheur river and Dead Ox siphons, Owyhee project, Ontario, Oreg.; bids opened.

412 tons, black high tensile, bureau of supplies and accounts, navy department, Washington, schedule 3807; for Philadelphia navy yard; bids Dec. 7.

350 tons, approximately, plates, shapes and bars, for repairs for a tanker for the Texas Co., New York, awarded through Sun Shipbuilding & Dry Dock Co., Chester, Pa., to unnamed producers.

135 tons, 8 to 24-inch welded steel pipe, La Mesa, Spring Valley and Lemon Grove irrigation district, La Mesa, Calif.; district purchased reinforced concrete pipe.

Unstated tonnage, one 120 x 44 x 8-foot whirler derrick boat, Buffalo engineers; Midland Barge Co., Midland, Pa., low at $71,400. McClintic-Marshall Corp., Bethlehem, Pa., second low at $73,500, and Defoe Boat & Engine Works, Bay City, Mich., third at $78,000.

Sheets

Sheet Prices, Page 54

Pittsburgh—Sheet mill operations last week were uninterrupted at 40 per cent for the industry. This represents a gain of almost 10 points from the week preceding, with present rolling schedules made up of fairly heavy automotive orders plus a fair share of drum, small tank and miscellaneous galvanized business. The Pittsburgh market on black sheets at 2.40c, galvanized at 3.10c, and heavy hot-rolled at 1.85c, are firm.

Cleveland—Sheet production in this district last week held at 50 per cent for the second consecutive week. Schedules are steadier than in several months, due to specifications from automobile manufacturers and partsmakers. Finishing mill operations were suspended Thanksgiving day. A gradual gain in orders is reported by leading sheet interests, and this improvement is expected to contniue as automobile production increases.

Chicago—Sheets continue one of the most active of steel products, with most of the betterment compared with conditions 30 to 60 days ago attributable to expanding automotive needs. At the same time miscellaneous consumers and farm implement manufacturers have contributed better orders and prospects for a maintenance of recent activity during December are favorable. With first quarter prices unchanged from current levels, there is no tendency to accumulate stocks other than for early needs. Books now are opened for first quarter business.

Boston—Sheet buying has improved slightly with more car orders. Jobbers' orders are heavier. Container makers are taking only a fair volume while a seasonal tapering of small tank building is noted.

Philadelphia—Sheet sellers look for improved autobody buying this month. At present general buying is spotty, with sellers endeavoring to get first quarter contracts lined up at unchanged prices.

Buffalo—Demand for sheets continues light. Producers look for an improved market during the first quarter.

Cincinnati—Sheet demand from miscellaneous users was well sustained during the past month at a level considerably higher than in October. A pickup is noted in sales of electrical sheets.

St. Louis—Buying is affected by the desire to hold down stocks against the inventory period. Stove and implement makers continue to take liberal tonnages.

Transportation

Track Material Prices, Page 55

New York Central is completing construction of its first streamlined high-powered steam locomotive. It is of the Hudson type, with 13 pairs of wheels. Speed is estimated at 90 miles an hour or more, with head air resistance reduced 35 per cent or more. Driving wheels of 79 inches diameter are to be equipped with roller bearings.

Chicago, Milwaukee, St. Paul & Pacific is asking permission of the interstate commerce commission to construct two high-speed streamlined locomotives and to air condition 26 passenger coaches now under con-

In the "gay nineties" manufacturers had plenty of time, and milling cutters were reasonably simple tools. Nowadays, the deep cuts and fast feeds that characterize modern milling practice have brought about more powerful machines, radically different tooth design—and infinitely better steel.

Ludlum has always worked very closely with tool manufacturers, learning their problems, studying the requirements of their customers, and developing the needed high speed and alloy steels, in forged and bar form as circumstances demanded.

NRA CODE

Ludlum LXX *High Speed Steel* has had a prominent part in the development of modern milling cutters and hobs, as well as taps, drills and other high speed high production tools. Of particular interest is the Ludlum line of forged blanks which have been widely used.

There is a Ludlum Blue Sheet on LXX High Speed Steel giving complete data on its physical characteristics and its correct working, which is yours for the asking. You may also have the aid of Ludlum engineers in the application of LXX or any of Ludlum tool or alloy steel.

LUDLUM

LUDLUM STEEL COMPANY, WATERVLIET, NEW YORK
SILCROME · TOOL STEELS · NITRALLOY

struction. Present PWA funds will cover this work, except for $10,000 the road will supply.

Atchison, Topeka & Santa Fe is preparing a budget for 1935 totaling about two and a half times the sum spent in 1934, including purchase of about 30,000 tons of rails and air conditioning of 280 cars at cost of $2,250,000. Purchase of three 660-horsepower diesel motor cars for passenger service and one diesel electric locomotive has been approved.

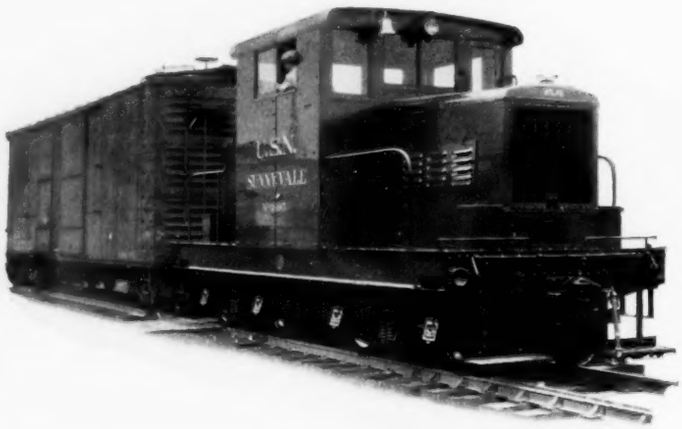
Illinois Central will air condition all its remaining sleeping and parlor cars in 1935. Total air conditioning by western roads next year will be close to 2500 cars, according to most recent estimates.

California Hardware & Supply Co., San Francisco, is low bidder on 690 tons of 40-pound tee rail for Los Angeles.

Tennessee Coal, Iron & Railroad Co. has accumulated sufficient small orders for a run of a week or more, beginning Dec. 10, at its rail mill at Ensley, Ala.

Lehigh Valley is expected to release shortly over 5000 tons of steel for repairs to 1350 box cars in its own shops. Capital Transit Co., Washington, has ordered ten street cars from J. G. Brill Co., Philadelphia, and ten from St Louis Car Co., St. Louis. All these cars will be fabricated of Cor-ten high tensile steel.

ATLAS GAS-ELECTRIC LOCOMOTIVES



45 Ton Locomotive especially suitable for economical interplant switching service.

OTHER ATLAS PRODUCTS

Gas-Electric and Diesel-Electric Locomotives . . . Electric Transfer Cars for Blast Furnaces and Steel Plants . . . Stockhouse Scale Cars for Blast Furnaces . . . Concentrate and Calcine Cars for Copper Refineries . . . Automatic and Remote Controlled Electric Cars . . . Pushers, Levellers and Door Extractors . . . Coal Charging Lorries, Coke Guides and Clay Carriers . . . Atlas Patented Coke Quenching Cars for By-Product Coke Ovens . . . Atlas Patented Indicating and Recording Scales . . . Special Cars and Electrically Operated Cars for every conceivable Purpose.

THE ATLAS CAR & MFG. CO.

Engineers . . . Manufacturers

CLEVELAND, OHIO

Locomotives Pending

Atchison, Topeka & Santa Fe, three 660-horsepower diesel cars for passenger service, one diesel-electric switching engine.

Rail Orders Pending

Atchison, Topeka & Santa Fe, 27,292 tons of 112 pound rails and fastenings, also 3400 tons of 90 pound rails and fastenings.

Pipe

Pipe Prices, Page 55

Pittsburgh — Placing of some fair-sized orders for oil country goods featured the pipe market as November closed, bringing the tubular product specifications of the latter month to around 10 per cent better than October. No large orders are noted and the market still lacks line pipe business, excepting small feeder lines occasionally. In addition to the reaffirmation of standard pipe discounts, boiler tube discounts also have been extended for the first quarter.

Cleveland—Included in small cast pipe projects for northern Ohio towns is 6300 feet of 6-inch and 1000 feet of 8-inch, approximately 127 tons for water lines in Avon Lake village, funds for which have been appropriated. Columbus, O., has awarded 500 tons for its sewer improvement section No. 3. The market is not promising for the remainder of the year, many communities not having the funds to purchase material, even with the government offering to supply the labor.

Chicago — While a number of orders for moderate tonnages of cast pipe have been placed tentatively, few large lots have been closed. In some instances considerable delay has followed the placing of orders, shipment in one case having been postponed more than a year following receipt of the order. New inquiries from the Chicago sanitary district are lacking but some are expected in the near future.

Boston — Merchant steel pipe buying is steady, but inquiry for

larger diameters is lacking. Utilities have bought but little steel pipe, although one company is in the market for a round tonnage of 24-inch for a Baton Rouge, La., project. The water supply dam at Enfield, Mass., may take considerable steel or cast iron pipe, depending on the method of construction.

New York—Five hundred tons of 54-inch steel intake pipe for Niagara Falls, N. Y., still is pending.

Bids will be opened Dec. 7 by the bureau of supplies and accounts, navy department, Washington, on several hundred tons of wrought iron and steel pipe in various sizes for delivery to navy yards, under schedule 3805.

San Francisco — Unnamed interests took 200 tons of cast iron and 600 tons of steel pipe for a water system improvement project at Spanish Fork, Utah. Awards of cast iron pipe for the week were the largest in over a month and brought the total for the year to 41,914 tons. Newberg, Oreg., has opened bids on 304 tons of cast iron pipe or 175 tons of steel pipe.

Cast Pipe Placed

500 tons, sewer contract No. 3, Columbus, O., to United State Pipe & Foundry Co., Burlington, N. J.

200 tons, various sizes, Spanish Fork, Utah, to unnamed interest.

110 tons, 8 and 12-inch, class 150, Huntington Park, Calif., to National Cast Iron Pipe Co., Birmingham, Ala.

Steel Pipe Placed

600 tons, various sizes, Spanish Fork, Utah, to unnamed interest.

Cast Pipe Pending

1100 tons, 24-inch, Watervliet, N. Y.; bids Dec. 13.

304 tons, 10-inch, class 150, Newberg, Oreg.; bids opened.

227 tons, 4 to 8-inch, class 150 and 200, Santa Monica, Calif.; bids opened.

127 tons, 6 and 8-inch for water lines, Avon Lake, O.; funds appropriated, plans approved; T. W. Laundon, Elyria, O., engineer.

100 tons, 6-inch, Chicago; Glamorgan Pipe & Foundry Co., Lynchburg, Va., low; American Brake Shoe & Foundry Co., Chicago, low on 75 tons of offset bends.

Unstated tonnage, 5300 feet, water department, Fond du Lac, Wis.; bids opeed Nov. 13 rejected, new bids next spring.

Unstated tonnage, 12,040 feet of 10-inch, pressure sewer, state hospital, Mendota, Wis.; J. M. Walsh, 2319 Holister avenue, Madison, low bidder on general contract.

Steel Pipe Pending

175 tons, 10-inch, Newberg, Oreg.; bids opened.

120 tons, small sizes, heating and plumbing, parcel post building, Boston.

Semifinished

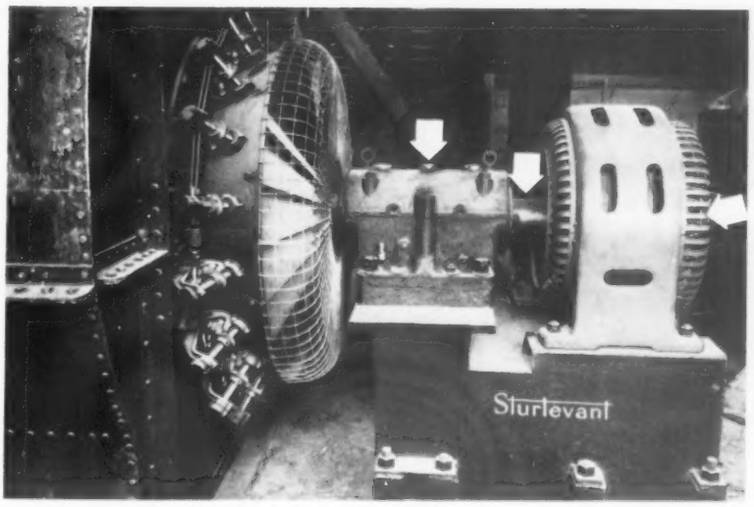
Semifinished Prices, Page 55

While it is unlikely that the bar mill base price will be applied to 5 x 5-inch billets, an important change in forging-quality billets is expected to become effective shortly. It is expected that all sizes over a 4 x 4-inch base, in forging quality, will be considered a billet; all under, a bar. However, for the time being forging billets have been named at an unchanged $32, base Pittsburgh, for the first quarter. While wire rod specifications are picking up and skelp is fairly active, the open market on sheet and tin bars is experiencing some losses.

LOOK!...

No ~~Motor Bearings~~

No ~~Coupling~~



Patent Applied For

A Sturtevant Draft Fan Achievement!

It's a Sturtevant Vane Control Mechanical Draft Fan . . . with the synchronous motor rotor *overhung* on the fan shaft. Result:—motor bearings, motor end-bells, and coupling . . . ALL ELIMINATED!

Advantages: (1) Possibility of motor bearing trouble eliminated; (2) coupling wear banished; (3) no misalignment vibration; (4) vibration of fan rotor reduced to a minimum; (5) saving in equipment cost; (6) elimination of the commonly used and more costly variable speed motor and its complicated control.

Sturtevant makes available mechanical draft equipment at its highest stage of development, in simplicity, efficiency, and dependability. This is a typical example.

B. F. STURTEVANT COMPANY

Main Offices: Hyde Park, Boston, Mass., Chicago, Ill., 400 North Michigan Avenue, San Francisco, Cal., 681 Market Street

Branch Offices in Other Cities

Sturtevant DRAFT FANS

DRAFT FANS . TURBINES . GEARS . ECONOMIZERS . AIR HEATERS

Shapes

Structural Shape Prices, Page 54

Chicago—Inland Steel Co., here, has booked 21,000 tons of steel piling for the government dam at Grand Coulee, Wash., the largest individual piling order ever placed in this country. While structural awards and inquiries are heavier, most projects are located in outlying districts. Plans for the Winona, Minn., dam have been received and include about 1400 tons of plates and shapes and 1343 tons of piling. Bids close at St. Paul, Dec. 20. New inquiries include 1900 tons for Texas highway bridges and 1400 tons for a university building at Austin, Tex.

Pittsburgh—Some modification of regulation 9 to the steel code, providing for the identification of specific structural projects before fabricated-in-transit allowances will be granted, is considered likely. This regulation has been effective since Oct. 5, but under considerable protest from the smaller shape fabricators. It also developed last week that the mill quantity extras on shapes might not become effective with Dec. 31 shipments. American Bridge Co., Pittsburgh, has begun fabrication at Ambridge, Pa., on building No. 6 for Radio City, a release of 17,000 tons against the original contract of about 100,000 tons placed several years ago.

Cleveland—Closure Service Co., Toledo, O., subsidiary of the Owens-Illinois Glass Co., has awarded 400 tons for a building in Toledo to Fort Pitt Bridge Works, Pittsburgh. Several other fair-size projects are pending, with award of 3060 tons for the Lorain road bridge over Rocky river, Cuyahoga county (Cleveland) expected shortly. Leading fabricators here did not bid direct on this job, which was taken by a general contractor, now negotiating for the steel.

Boston—Award of a 1090-ton bridge at Revere, Mass., is expected to be made this week to a Buffalo, N. Y., fabricator, low bidder. Bids being over the appropriation, 8500 tons for the Boston parcel post building still is held up. Awards total several hundred tons, including a second 200-ton bridge at Worcester, Mass.

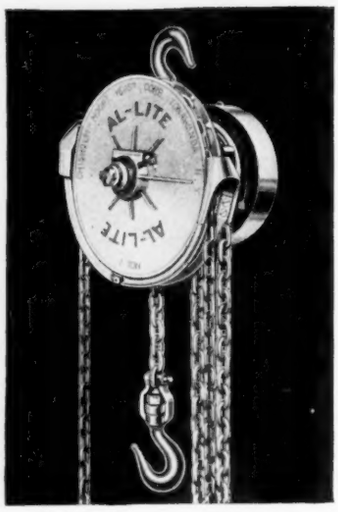
New York—Structural steel lettings dropped sharply, following one of the best weeks of the year. New tonnage on which early action is likely also is small. First structural steel for the Tri-boro bridge here, except that required for towers which has been bought, is expected out in several weeks.

Shipments of fabricated structural steel for October were the largest for any month this year, according to reports received by the American Institute of Steel Construction, New York. They were 38 per cent larger than for the month last year. Bookings were 28 per cent below the average for the preceding nine

Shape Awards Compared

	Tons
Week ended Dec. 1	32,175
Week ended Nov. 24	25,385
Week ended Nov. 17	17,651
This week in 1933	32,145
Weekly average, 1933	9,296
Weekly average, 1934	16,874
Weekly average, November	22,332
Total to date, 1933	723,348
Total to date, 1934	826,841

FIRST & FOREMOST IN
LIGHTNESS...SPEED
...EFFICIENCY



AL-LITE
Safety
HOIST
(of Alcoa Aluminum Alloy)

AL-LITE leads the way! The only hoist ever to be built of Alcoa Aluminum Alloy and embodying the newest developments in hoist design from hook to hook—AL-LITE is a genuine achievement in modern industrial design.

⅓ LIGHTER... because it is aluminum! Yet, along with this unique feature, you get a 5 to 1 safety factor. One man can handle an AL-LITE easily and quickly. Engineers call it the "first one-man hoist in history." It's the first genuinely safe hoist, too, with a patented Safety Overload Governor that automatically prevents dangerous overload.

Isn't your plant "primed" today for the AL-LITE idea? It is, if obsolete hoists are cutting into profits. Better call your distributor for full details, or write Chisholm-Moore Hoist Corp., Tonawanda, N. Y. (Division Columbus-McKinnon Chain Corporation.

CHISHOLM-MOORE
CHAIN HOISTS TROLLEYS — CM — ELECTRIC HOISTS CRANES

AL-LITE

months, but approximately equal to the bookings during the month in 1933.

Philadelphia—Little structural activity is noted locally. However, fabricators are figuring on some good tonnages outside the district, including the 8000-ton Library of Congress addition, on which bids are to be opened Dec. 19. Bids have been opened on an 800-ton coal pier for the Norfolk & Western railroad at Lambert, Va., and on a 1300-ton parcel post building at Richmond, Va. Shapes are 1.90c, Bethlehem, Pa., or 2.00½c, Philadelphia, with these prices extended for first quarter.

Washington—Bids will be received at United States coast guard headquarters here Dec. 13 for the construction of 1975 linear feet of cellular type steel sheet pile bulkhead, comprised of 53 cells, and approximately 322 linear feet of straight wall type steel sheet pile bulkhead at the coast guard base, Oakland harbor, Alameda, Calif.

Birmingham, Ala. — Structural shape fabricating shops here are operating at about 60 per cent, with orders in small lots.

San Francisco—A tunnel rib job in Los Angeles, requiring 1150 tons, has been let, and fabricators are entering bids on 719 tons for two bridges in California. Awards in the week totaled over 2500 tons.

Shape Contracts Placed

21,000 tons, piling, dam at Grand Coulee, Wash., to Inland Steel Co., Chicago.

1150 tons, tunnel ribs, specification M-2029, metropolitan water district, Los Angeles, to Commercial Shearing & Stamping Co., Los Angeles.

1090 tons, including 150 tons steel grid flooring, state bridge over tracks of Boston, Revere Beach & Lynn railroad, Revere, Mass., to Lackawanna Steel Construction Corp., Buffalo, at $121,987.40; bids Nov. 20.

1000 tons, warehouse, Stockton, Calif., to Ingalls Iron Works Co., Birmingham, Ala.

850 tons, bridge, Georgetown, S. C., to National Bridge Works, Long Island City, N. Y.

730 tons, gate frames, Sheffield, Ala., for Tennessee valley authority to Virginia Bridge & Iron Co., Roanoke, Va.

710 tons, boiler house, St. Louis, to Superior Structural Steel Co., St. Louis.

670 tons, state highway bridge, Miami, Okla., to J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.

500 tons, piling, bulkhead at Point Judith, R. I., to Kalman Steel Corp., Bethlehem, Pa.; through Merritt-Chapman & Scott Corp., New York.

490 tons, Moore Haven lock, Lake Okeechobee, Florida, to Virginia Bridge & Iron Co., Roanoke, Va.

400 tons, bridge, Motley, Minn., to Minneapolis-Moline Power Implement Co., Minneapolis.

300 tons, two buildings for Polytechnic high school, Long Beach, Calif., to unnamed interest.

300 tons, state bridges, Missouri, to Missouri Valley Bridge & Iron Co., Leavenworth, Kans.

230 tons, Plantation street viaduct, Worcester, Mass., to McClintic-Marshall Corp., Bethlehem, Pa.

225 tons, store building, Columbia, S. C., to Ingalls Iron Works Co., Birmingham, Ala.

200 tons, Cambridge street bridge, Worcester, Mass., to Boston Bridge Works, Cambridge, Mass.; Coleman Bros. Co., Boston, general contractor.

190 tons, beam spans, Pierce county, Nebraska, to Omaha Steel Co., Omaha.

185 tons, reconstruction of building, Chicago stockyards, for Chicago Rapid Transit Co., to Hansell-Elcock Co., Chicago.

185 tons, Chicago elevated railroad repairs, to Hansell-Elcock, Co., Chicago.

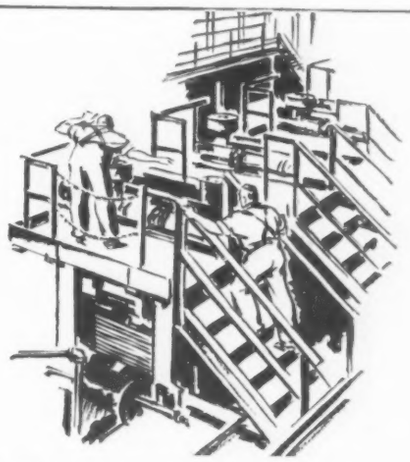
180 tons, state highway bridge, Cambridge, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

180 tons, state highway bridge, NRS-8479, Washington county, New York, to McClintic-Marshall Corp., Bethlehem, Pa.

175 tons, truss spans, Greene county, Illinois, to Virginia Bridge & Iron Co., Roanoke, Va.

175 tons, bridge, Harlan, Kans., to Midland Structural Steel Co., Chicago.

150 tons, addition to Helms Bakeries, Los Angeles, to Consolidated Steel



The Making of Steel is Safer with "AW Diamond" Steel Floor Plates

"There goes the whistle!" Pit covers roll back, giant fingers grab—the chariot moves and the ingot is on its way.

Speed is essential. Swift movement is necessary. To insure such movement, *with safety,* runways, platforms, stairways and crossovers are "paved" with "AW" ROLLED STEEL DIAMOND FLOOR PLATES.

The Steel Industry is proud of its safety records! That is why you find these scientifically designed floor plates everywhere. They are permanent and sure.

Also furnished in nonferrous metals.

SLIP-PROOF • OIL-PROOF
HEAT-PROOF • CRACK-PROOF
SAFE • SIGHTLY
SELF-DRAINING
SPLINTERLESS

ALAN WOOD STEEL CO. ESTABLISHED 1826 TRADE "A.W." MARK CONSHOHOCKEN, PA.

108 Years' Iron and Steel Making Experience

ALAN WOOD STEEL COMPANY

CONSHOHOCKEN, PA.

Branch Offices—Philadelphia—New York—Seattle
Los Angeles—San Francisco—Houston—Boston ★

Corp., Los Angeles.

150 tons, railroad overpass, Louisiana project SP-4808, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

135 tons, building for Ford Instrument Co., Long Island City, N. Y., to American Bridge Co., Pittsburgh.

110 tons, beam spans, Frontier county, Nebraska, to Pittsburgh-Des Moines Steel Co., Des Moines.

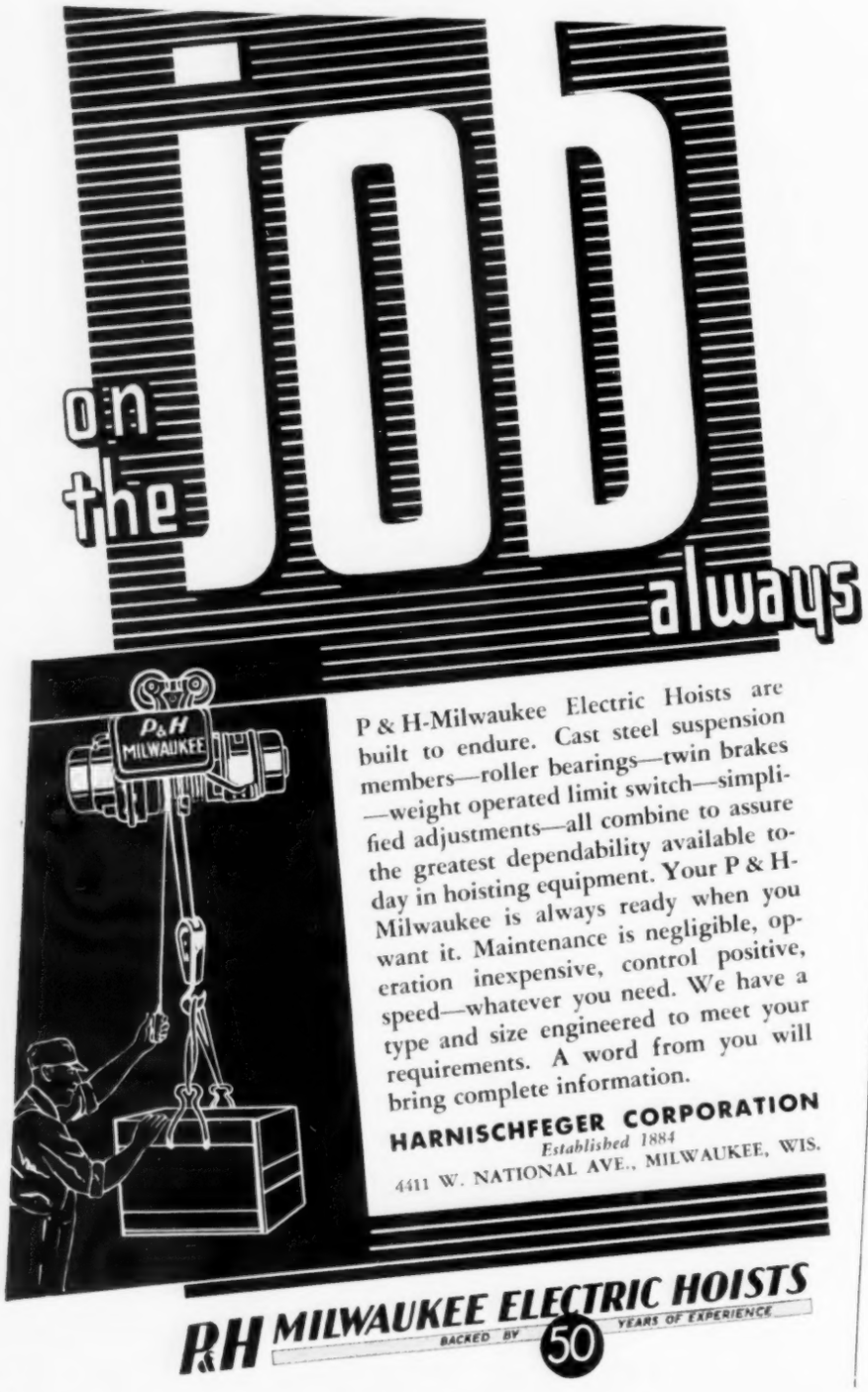
110 tons, stock house, Gunther Brewery Co., Baltimore, to Bethlehem Fabricators Inc., Bethlehem, Pa.

105 tons, hospital building, Petersburg, Va., to Roanoke Bridge & Iron Co., Roanoke, Va.

102 tons, shapes and bars, building, Our Lady of Lourdes Memorial hospital, Binghamton, N. Y., to Leach Steel Co., Rochester, N. Y., and Kalman Steel Corp., Bethlehem, Pa.; P. Pavia, Binghamton, general contractor.

100 tons, shapes and bars, school, Leonardsville, N. Y., to Utica Structural Steel Co., Utica, N. Y., and Kalman Steel Corp., Bethlehem, Pa.; E. C. Richards & Son, Utica, general contractor.

100 tons, state highway bridge 1372, Circleville, W. Va., to Midland Structural Steel Co., Chicago.


on the job always
P&H MILWAUKEE
P & H-Milwaukee Electric Hoists are built to endure. Cast steel suspension members—roller bearings—twin brakes—weight operated limit switch—simplified adjustments—all combine to assure the greatest dependability available today in hoisting equipment. Your P & H-Milwaukee is always ready when you want it. Maintenance is negligible, operation inexpensive, control positive, speed—whatever you need. We have a type and size engineered to meet your requirements. A word from you will bring complete information.
HARNISCHFEGER CORPORATION
Established 1884
4411 W. NATIONAL AVE., MILWAUKEE, WIS.
P&H MILWAUKEE ELECTRIC HOISTS
BACKED BY 50 YEARS OF EXPERIENCE

Shape Contracts Pending

6500 tons, dam No. 16, Muscatine, Iowa; bids postponed from Nov. 27 to Dec. 4.

2750 tons, including 1343 tons of piling, dam, Winona, Minn.; bids to United States engineers at St. Paul, Dec. 20.

1900 tons, state bridges, Texas.

1850 tons, specification 77, metropolitan water district, Los Angeles; bids Dec. 17.

1400 tons, building, University of Texas, Austin, Tex.

1287 tons, parcel post building, Richmond, Va.; Spence Bros., Saginaw, Mich., low for general contract.

1000 tons, seven Illinois bridges; bids Dec. 12.

800 tons, coal pier, for Norfolk & Western, Lambert, Va., bids opened.

650 tons, public school No. 48, South Jamaica, N. Y.

500 tons, textile plant addition for the Blue Ridge Co., Glasgow, Va.; bids to be opened this week; Ballinger & Co., Philadelphia, architects.

420 tons, state highway bridges, Alma and Clintonville, Wis.

400 tons, grade separation; Newburyport, Mass.

400 tons, transit shed addition, berth 177, Los Angeles; bids Dec. 12.

302 tons, Feather river bridge, Plumas county, California, for state; bids Dec. 12.

285 tons, state bridges in Armstrong, Westmoreland and Wyoming counties, Pennsylvania; bids Dec. 14. Also 60 tons of reinforcing bars.

250 tons, state penitentiary, Reedville, Ga.; Struck Construction Co., Louisville, Ky., low on general contract; 750 tons of bars also required.

247 tons, state bridge over Erie railroad, Pompton Plains, N. J.; bids Dec. 17.

210 tons, Shurtleff school, Boston; Rugo Construction Co., Boston, general contractor.

200 tons, Missouri river bridge, Broadwater county, Montana, for state; bids opened.

175 tons, state highway bridge, Kaufmann, Ill.

122 tons, state bridge in Sutter county, California; bids opened.

117 tons, Kings river bridge, Fresno county, California, for state, bids Dec. 12.

110 tons, state office building, Providence, R. I.; O. D. Purrington Co., Providence, low.

105 tons, Georgetown branch library, Washington, Bahen & Wright Inc., Washington, low.

100 tons, school, Andover, Mass.

100 tons, state bridge, Jefferson county, Colorado; bids opened.

Quicksilver

New York—Quicksilver is quiet, with the small-lot price unchanged at $75 a flask, and lots of 100 or more flasks available down to $72.50.

Reinforcing

Reinforcing Bar Prices, Page 55

Pittsburgh—Small projects are noted in the reinforcing bar market. Carload lots of new billet bars hold at 2.05c, Pittsburgh, in cut lengths. There is report of a project for a government-financed series of reinforced concrete bridges across the Florida keys to Key West, Fla.

Cleveland—The market for reinforcing bars is quiet, purchases being limited to small lots for miscellaneous construction purposes. A few jobs requiring 100 to 300 tons of bars, previously reported, still are pending.

Chicago—Bids on the Milwaukee filtration plant involving 4000 tons of bars have been rejected since only two were received. Reinforcing bar orders have declined recently while inquiries also are fewer. This is partly a seasonal trend although bridge work will be continued during winter months. Private building work involving concrete bars is less active than was true a month or two ago. Bids close Dec. 20 at St. Paul on 310 tons for the Winona, Minn., dam.

Boston—Reinforcing bar buying is generally in lots under 100 tons. The Bass river bridge, Yarmouth-Dennis, Mass., will take close to 400 tons. New England Foundation Co., Boston, has the general contract.

New York—Highway mesh requirements, while smaller, total close to 800 tons, to be placed. Award is expected this week on 900 tons for the parcel post building foundation, Manhattan, while bids closed on piers, Tri-boro bridge, Randalls Island and Little Hell Gate, taking 625 tons. Inquiry for New Jersey projects is slightly heavier.

Philadelphia—Little activity is noted in this district. Some sellers here are figuring on 750 tons of bars for the Georgia state penitentiary at Reedville, Ga., on which the Struck Construction Co., Louisville, Ky., general contractor, is low. Billet steel bars in cut lengths are unchanged at 2.05c, Pittsburgh, or 2.34c, Philadelphia.

The New Jersey state highway commission proposes to spend more than $10,500,000 for road work next year.

Cincinnati—Reinforcing bar demand here is limited to small tonnages. Interests here are expecting soon an announcement on about 2000 tons of reinforcing bars required for a Tennessee valley authority dam.

San Francisco—Awards in the week aggregated less than 500 tons. The metropolitan water district, Los Angeles, has rejected bids on the second unit of their aqueduct, calling for 10,500 tons, and will readvertise.

Concrete Awards Compared

	Tons
Week ended Dec. 1	1,997
Week ended Nov. 24	1,697
Week ended Nov. 17	1,100
This week in 1933	5,130
Weekly average for 1933	3,232
Weekly average, 1934	4,221
Weekly average, November	1,695
Total to date, 1933	174,788
Total to date, 1934	206,821

Reinforcing Steel Awards

325 tons, California Fruit Growers Exchange building, Los Angeles, to Concrete Engineering Co., Los Angeles.

320 tons, Kensington school, Buffalo;

CREFLEX WELDING FITTINGS have a number of distinctive advantages not possessed by other types of pipe fittings for welding.

For example, in the above photograph, 22 circumferential welds were eliminated by using CREFLEX WELDING FITTINGS with long tangents. RESULTS—lower installation costs.

Also longer tangents on CREFLEX WELDING FITTINGS removed all necessary welds far from zones of high stress and provided a higher factor of safety in the welds. RESULTS—stronger, safer pipe lines.

In four lines can be seen two or more CREFLEX WELDING FITTINGS incorporated in a single continuous length of pipe in more than one plane. No other type of welding fitting offers this feature. RESULT—greater ease and speed in lining up preparatory to welding.

Learn all the advantages of CREFLEX WELDING FITTINGS. Full information is contained in Bulletin W-101. Write for it today.

PITTSBURGH PIPING & EQUIPMENT CO.

43rd ST. & A. V. R. R. PITTSBURGH, PA.

BRANCH OFFICES: NEW YORK, CHICAGO, DETROIT, BOSTON, INDIANAPOLIS, SAN FRANCISCO, CLEVELAND, HOUGHTON, MICH.

220 tons to Concrete Steel Co., New York; 100 tons to Kalman Steel Corp., Bethlehem, Pa.; through R. E. Williams & Son.

250 tons, jail buildings, Bordentown, N. J., to Igoe Bros., Newark, N. J.; through Pellechia Contracting Co.

232 tons, ward building, City hospital, Boston, to Concrete Steel Co., New York; Matthew Cummings Co., Boston, general contractor.

200 tons, mesh, highway, Delaware county, New York, to American Steel & Wire Co., New York; through E. V. Campbell, Binghamton, N. Y.

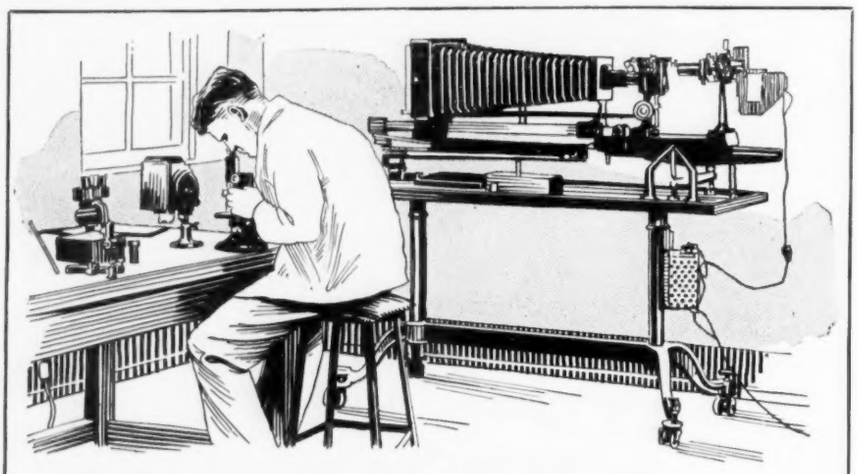
170 tons, filtration plant, Wymouth, Mass., to Northern Steel Co., Boston.

150 tons, buildings, state hospital, Waltham, Mass., to Concrete Steel Co., New York; Matthew Cummings Co., Boston, general contractor.

130 tons, highway, South Dennis, N. J., to Truscon Steel Co., Youngstown, O.; through E. H. Ellis Co.

120 tons, bars and shapes, school, Hempstead, N. Y., to Carroll-McCreary Co. Inc., Brooklyn, N. Y., and August Bellon Inc., Far Rockaway, N. Y., 40 tons of shapes.

100 tons, bars and shapes, school, West Roxbury district, Boston, to Northern Steel Co., Boston, and Groisser & Schlager Inc., Boston; Carilli Construction Co., general contractor.



WHY?

YOU SHOULD CONSULT THE METALLURGICAL DEPARTMENT

• Years of experience available to you on your next problem regarding proper grade of COLD DRAWN STEEL for the particular job you have in mind.

Regular stocks of standard sizes available in Moltrup's distributor's stock in your territory.

•

Moltrup Steel Products Co.

Beaver Falls, Pa.

(Pittsburgh District)

New York • Chicago • Philadelphia • Cleveland • Boston • Houston • Detroit • Erie
San Francisco • Atlanta • Norfolk • Seattle • Pittsburgh • Buffalo • Dayton

Reinforcing Steel Pending

6000 tons, Monrovia and Pasadena tunnel metropolitan water district, Los Angeles; bids Dec. 17.

1100 tons, four state highways and one bridge project, New Jersey; bids Dec. 17.

750 tons, state penitentiary, Reedville, Ga.; Struck Construction Co., Louisville, Ky., low on general contract; also 250 tons of shapes required.

508 tons, Almaiden, Calero and Stevens creek dams, Santa Clara county, California; bids Dec. 6.

400 tons, bridge, Bass river, Yarmouth-Dennis, Mass.; New England Foundation Co., Boston, low.

310 tons, dam, Winona, Minn.; bids to United States engineers, St. Paul, Dec. 20.

300 tons, sewer, Brooklyn, N. Y.

150 tons, substructure and approaches, state bridge over Boston, Revere Beach & Lynn railroad, Revere, Mass.; M. McDonough Co., Saugus, Mass., general contractor.

136 tons, bars and shapes, bridge, Oak Bluffs-Tisbury, Mass.; Rendle Contracting & Dock Building Co., East Boston, low.

125 tons, school, Sebastopol, Calif.; bids Dec. 4.

116 tons, noncommissioned officer's quarters, France Field, C. Z.; bids opened.

100 tons, city hall, Santa Ana, Calif.; bids opened.

Strip Steel

Strip Prices, Page 55

Pittsburgh — Prospect of a new system of extras on hot and cold-rolled strip steel appears to be delayed from the original intent of applying this reclassification for first quarter of 1935. While hot and cold strip demand in November was some 25 to 30 per cent better than in October, last week's buying was less. Some strip mills closed here from Nov. 28 to Dec. 3. The market is firm at 1.85c, Pittsburgh, for hot strip and 2.30c, Pittsburgh or Cleveland, for cold strip. Stainless steel strip orders show improvement.

Cleveland—Barring the Thanksgiving holiday when finishing capacity generally was shut down, some stripmakers have just experienced the first two weeks of continuous operation since June. Automotive orders have held to the recent rate of improvement, but have not increased, leading producers report.

Midland Steel Products Co., with headquarters in Detroit, and an automobile steel stamping division in Cleveland, has closed a contract with Reo Motor Car Co. for its entire frame requirements for the remainder of 1934 and 1935, which will require a large tonnage of hot rolled strip.

Chicago—Activity in strip is im-

proving gradually as automotive needs expand. Demand from motor car interests is spotty with better diversification anticipated later this month. First quarter books are open at unchanged prices.

Boston — While spotty, cold-strip demand holds to the recent rate. Cold strip in numerous instances is meeting competition with slit sheets. Demand for hot strip is sluggish.

New York—Strip specifications in November were better than in October, with current buying well sustained. Some producers are negotiating for contracts for first quarter at unchanged prices.

Philadelphia — With strip prices unchanged for first quarter at 2.14c, Philadelphia, for hot strip and 2.89c, for cold, consumers continue to buy for only spot needs. Influencing this character of buying is the desire of consumers to keep stocks at a minimum until after inventory time.

Wire

Wire Prices, Page 55

Pittsburgh—Practically all producers of wire products have completed filing of first-quarter prices, naming nails at $2.60 per keg, manufacturers' wire at 2.30c and high carbon spring wire at 2.90c, Pittsburgh or Cleveland base. Filing of prices on wire rods was somewhat delayed last week but it is indicated that the $38 base continues. The less-carload extra on wire products, cancelled several months ago, is to be reinstated shortly with the application of the former carload extra on merchant products on sales for delivery on or after Jan. 1, 1935.

Cleveland—Books for first quarter for wire and wire products having been opened Dec. 1 at unchanged prices, the chief improvement in demand for that period is noted on the part of jobbers, who are placing contracts. Orders from manufacturers are sustained at their recently improved level. Nut and bolt makers are expected to resume buying shortly, as they are now receiving larger releases from automobile interests.

Chicago—First quarter books have been opened at prices unchanged from recent levels except for a revision in classification of wire rods. The new schedule calls for an extra of $2 on rods from 15/32 to 47/64-inches. Rods up to 15/32 take the former $39, Chicago, price. Sales and specifications still tend upward with better participation by automotive interests accounting for a portion of recent gains. The market lacks the speculative buying which prevailed a year ago, with most orders for prompt requirements.

Philadelphia—While manufacturing consumers are specifying lightly, there has been improved buying by warehouses. One seller regards buying as the best in several weeks.

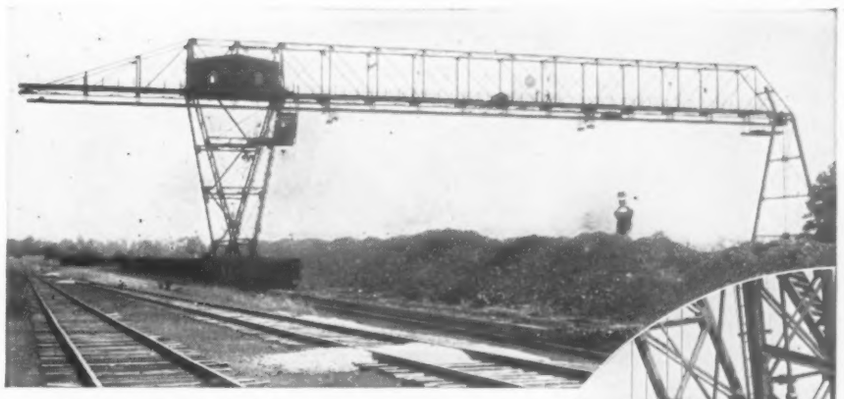
Boston—Wire drawing operations remain unchanged from last week. New England consumers are increasing small-lot specifications. Demand is broad, but specialties, notably textiles, are inclined to lag. Massachusetts has changed specifications for guard rail rope, increasing tensile strength, as required by other states.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 55

Within a week to ten days first quarter prices on bolts and nuts will

Gantry and Special CRANES



Two-Ton Coal Handling Gantry Crane.

● COAL AND ORE HANDLING BUCKETS

● COAL AND ORE HANDLING BRIDGES.

The super-efficiency — the operating economy—and the durability of Wellman installations throughout the world, reflect the high character of Wellman Engineering and Construction. *May we figure on your problems?*

Steel Mill Equipment . . Coal and Ore Handling Equipment . . Car Dumpers, all types Williams Buckets and Trailers . . Gas Producers, Flues, etc. . . Gas Reversing Valves Blast Furnace Skip Hoists . . Safety Stops for Traveling Structures . . Special Cranes Port and Terminal Equipment . . Castings and Machine Work to customers' drawings

THE WELLMAN ENGINEERING CO.
ENGINEERS CONSTRUCTORS MANUFACTURERS
CLEVELAND, OHIO
WELLMAN
BIRMINGHAM · NEW YORK · MEXICO CITY

be determined, and in the industry it generally is expected that the present market, 70-10-10-10 off list, will be reaffirmed. Prices on large rivets at 2.90c, Pittsburgh or Cleveland, and 3.00c, Chicago, probably will be extended. Small rivets continue 70-5 off list.

Bolt, nut and rivet orders in November were little better than in October, according to producers at Pittsburgh.

Releases from automobile manufacturers are increasing at Cleveland, but demand from other sources shows little change. Railroads and jobbers are taking relatively small lots.

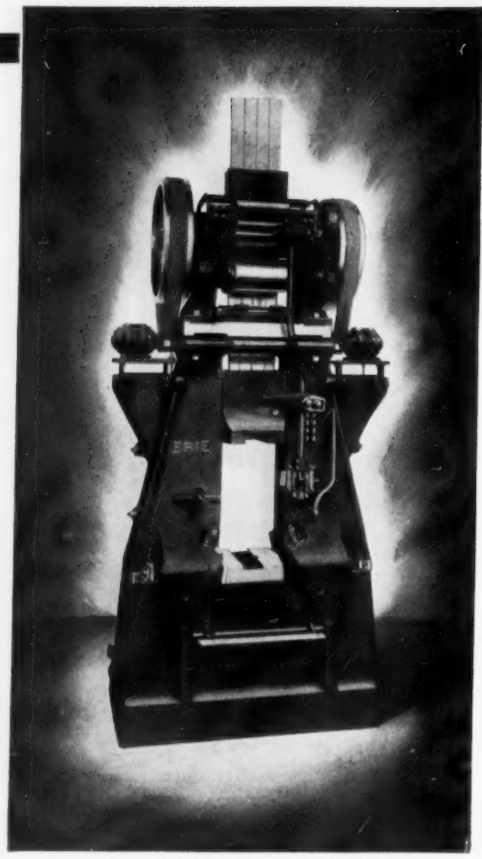
Tin Plate

Tin Plate Prices, Page 54

Pittsburgh—Because of sharp improvement in the operations of a leading interest, the tin plate industry's weekly production has mounted 5 points to almost 45 per cent. Last week, the leading interest raised its production to a 60 per cent basis and promises to hold at this level through at least this week and next, based mainly on receipt of several export orders for immediate shipment. However, some of the independents are operating at only 25 per cent. Contracting for 1935 has not proceded to any extent and mills are not producing in anticipation of it. As previously announced, the 1935 tin plate price is to be $5.25 on primes.

New York—In addition to continued buying of stock tin plate for delivery by the end of December, tin plate sales are augmented somewhat by orders for primes, on which there will be an increase in the extras from 10 to 20 cents effective Jan. 1.

Production or Distribution?



An economist recently said that the major problem of industry is no longer production, but rather it is distribution.

Perhaps you feel as we do that production is still a major problem owing to such factors as shortened work hours, higher wages, rising costs, unpopularity of overtime work—coming at a time when profits and purchasing power are not what they should be.

If producing forgings at relatively satisfactory cost is difficult for you as it is for many others—you will want to take advantage of improved types of forging machines which do the work faster. Specifically: ERIE steam and board drop hammers.

Write for data.

ERIE FOUNDRY COMPANY

ERIE, PENNA., U. S. A.

Detroit 335 Curtis Bldg. | *Chicago* 549 Washington Blvd. | *Indianapolis* 335 Postal Station Bldg. | *Paris, France* 8 Rue de Rocroy

ERIE

Pig Iron

Pig Iron Prices, Page 56

Pittsburgh—Lack of basic iron sales in this district is still keenly felt, as the nonintegrated melters in many cases continue to show a preference for heavy breakable cast iron scrap. However, a down-river mill has released to a minor extent on an old basic order and is once again accepting shipments. Roll-making foundries in this district are building up charcoal iron inventories slightly, but jobbing foundries, on two and three-day weekly schedules, are obviously not a market factor. One bright spot, however, continues to be the radiator shops. The present market of $18.50, Neville Island, continues on foundry grades, $18 on basic and $18.50 for bessemer.

Chicago—First quarter business is being accepted at unchanged prices of $18.50, furnace, for No. 2 foundry and malleable. Indications point to a substantial increase in contracts compared with those placed during this and the last quarters. Shipments retain recent gains, with November the most active month in deliveries since June. Automotive consumption is improving while needs of farm implement manufacturers are at a steady or higher rate. Reduced foundry operations among smaller foundries are expected during the latter half of December, due to the inventory period.

Cleveland—Merchant pig iron orders for relatively small tonnages are increasing in number, for delivery before Jan. 1. Additional evidence is at hand showing beneficial results of the government's home renovizing plans and the co-operative movement

on the part of manufacturers. Heating apparatus and sanitary ware manufacturers recently have attained the best production schedule in years. Dealers in these products are laying in stocks. The improvement in this direction so far has been more pronounced than in automotive demand for pig iron. Some of the leading automobile manufacturers, however, started with large inventories. Books for first quarter were opened Dec. 1 but as prices are unchanged little contracting is expected.

Boston—With prices reaffirmed for the first quarter, several inquiries, including one for 500 tons, have been reduced, consumers taking smaller shipments as required, being protected against an advance. Sales continue light and in small lots.

New York—Pig iron buying last week was light, with the holiday cutting into total sales. Sellers generally have opened books for first quarter at unchanged prices.

Philadelphia—Pig iron shipments are being fairly well maintained, although no large orders are reported. Sellers opened books Dec. 1 for first quarter at unchanged levels.

Buffalo—Good demand for small lots of iron continues in this market. Deliveries are going forward steadily, with the fourth quarter surpassing the third by wide margins in both sales and shipments. Deliveries are now believed to have surpassed merchant production here for the first time since July 1. Three blast furnaces are in production in the district, two being in steelworks.

Cincinnati—Orders for pig iron are being held to small tonnages. Interest in first quarter requirements is increasing. Releases to automotive foundries have been slow, but are expected to expand soon, more than offsetting year-end influences on other classes of melt.

St. Louis—While there has been some slowing down in shipments and buying of pig iron, the general feeling in this area is decidedly optimistic. November was a satisfactory month, shipments, according to preliminary reports, slightly exceeding those of October and representing the largest aggregate since last June. Present prices have been reaffirmed for the first quarter of 1935. The Granite City furnace price is $18.50 for foundry and malleable and $18 for basic, with 50c switching cost added for St. Louis delivery.

Birmingham, Ala.—Intimation of better demand for pig iron is noted but so far purchasing is small lots. Melters are carrying no inventories as yet. Four blast furnaces are in operation. Republic Steel Corp. is relining a furnace here and expects to light it early in January.

Toronto, Ont.—Merchant pig iron sales now are holding around 600 tons per week. The daily melt is around 35 to 40 per cent, with prospects for a higher rate early in the new year. Production is holding about 46,000 tons per month. Prices are firm and unchanged.

Climax Molybdenum Co. has removed its offices from 295 Madison avenue to 500 Fifth avenue, New York.

Cold Finished

Cold Finished Prices, Page 55

Pittsburgh — December shipments of cold-finished steel bars probably will be the best of any month in the last half of 1934. This is caused by heavier automotive specifications from the automotive field, entered

Liquitol

Reduces INGOT COSTS

What is LIQUITOL?

A scientifically prepared fine dry powder which insures sound iron castings, sound steel castings and sound steel ingots.

LIQUITOL retards Cooling of hot-top metal. Working on the theory that secondary piping is caused by occluded gases, it follows that if the hot-top is kept open longer gases have a better chance to escape.

Why is LIQUITOL *used?*

Eliminates piping in castings and ingots.

Heads reduced 40%.

Castings are structurally more perfect.

Cavities and porosities practically eliminated. Scrap heads and runners are greatly reduced. Better fluidity of molten metal during cooling. Additional feeding of heads reduced, thus prevents waste.

Does not injure or affect physical or analytical properties of steel or cast iron in any way.

Where intermittent feeding is practiced there is absolutely no possibility of LIQUITOL being carried into ingot or casting

Does not solidify but forms a fusible coating which can be disturbed for observation. Additional metal can be poured through LIQUITOL without danger of LIQUITOL entering body of ingot or casting.

LIQUITOL saves its cost many times, due to sounder ingots and castings you secure through its use.

Ask for Bulletin AL 16A

THE ALPHA-LUX COMPANY, INC.
192 Front St.
NEW YORK CITY
Branches: Philadelphia - Chicago

through late October and November with the stipulation that shipments be made only after Dec. 1. Agricultural implement manufacturers are fair buyers. The latter group expect a heavy volume of business in the spring of 1935, promised the best in four years. The market has been extended unchanged at 2.10c, Pittsburgh, which is firmly quoted. Likewise, cold-drawn alloy bars are firm and unchanged at 2.95c, Pittsburgh.

Scrap

Scrap Prices, Page 57

Pittsburgh — A strong market justified another 50-cent advance in scrap prices last week when one down-river mill paid $12 for hydraulic compressed sheets and another in the same district went over $12 to insure steady receipt of compressed and No. 1 heavy melting. Machine shop turnings are up $1 a ton with a $9 mill sale recorded and heavy breakable cast also is up $1 based on negotiations for a large sale last week at $11.50 or $12 a ton. The sole exception to a strong market is blast furnace borings and turnings here which are weak at $5.50 to $6. December rail lists are appearing, the B. & O. with 1800 tons of heavy melting closing Dec. 3 and the Pennsylvania with 7000 tons for Dec. 5. A Pittsburgh district mill last week purchased a tonnage of No. 1 railroad heavy melting steel for $12.25 per ton delivered. It now develops that a Valley mill recently purchased 70,000 tons of scrap and released 70,000 tons more rather than a purchase of over 50,000 tons, as first reported.

Cleveland—Shipments of steel and iron scrap from this market to Pittsburgh and the Valleys has caused prices to be marked up 50 cents to $1 per ton on various grades, conforming to higher prices in those centers. Holders of scrap are not inclined to sell except at an advance.

Chicago — While scrap demand recently has been limited to relatively small lots, the market has advanced further and railroad material continues to command attractive prices compared with quotations on mill purchases. In view of the lack of general mill participation since the middle of the year, heavy buying of scrap is in prospect this month or in January. Sales of heavy melting steel the past two weeks are estimated to have involved 10,000 to 15,000 tons. While some tonnage was sold at $9.50, delivered, $9.75 prevailed on a large portion. In contrast to this figure, bids on railroad scrap have ranged as high as $10.25, delivered. Cast scrap has been in better demand recently and prices are up 50 cents. Busheling and compressed sheets also are stronger.

Boston — Shafting is up 25 cents a ton, shipping point, with other grades unchanged, but firm. Activity is largely confined to buying for export, New England consumers of heavy melting steel making no effort to meet prices paid at dock.

The first substantial shipments of heavy melting steel scrap from New England to the Pittsburgh district for some time have been made following the latest rise in prices at Pittsburgh.

New York — Heavy melting steel scrap has been advanced 50 cents a ton for export, dealers paying $8.50, dock, for No. 1 and $7 for No. 2. While most activity is for boat shipments, domestic buying is more active with some heavy melting steel being bought in this district for Eastern Pennsylvania. Prices are firm on all grades.

Philadelphia — While the principal steel grades are unchanged, advances are noted in several descriptions of scrap. Some of these changes are largely nominal, although there is better general activity than a week ago.

Buffalo — Dealers are paying as much for some grades of scrap as the best open offers from consumers. This has brought new firmness and slightly higher prices. One consumer is reported to have increased his offer for No. 1 about 50 cents a ton. Recent activity has included a fairly active market for short steel rails and cast.

Detroit — Conditions in scrap generally are unchanged. Prices continue strong. Although scrap production recently has been at the lowest level of the year, an increase is in prospect this month as automotive operations expand.

An automotive producer is reported to have sold 10 carloads of hydraulic compressed scrap at $8, Lansing, Mich., and several cars of turnings and borings at $4.50.

Cincinnati — An upward trend in prices of iron and steel scrap, influenced in part by nearby markets, failed to bring out mill buying. Recent advances were not carried further during the past week, the mar-

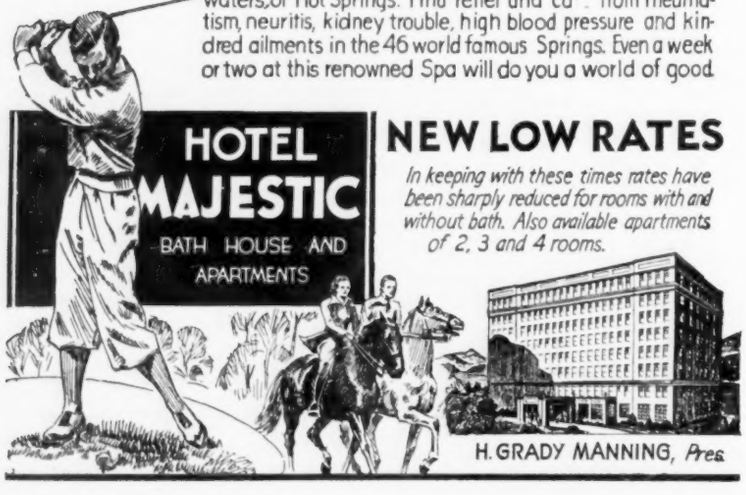
The Great Outdoors is Calling You Now to

Get away from the grind for awhile. Breathe the clear air in the Ouachita Mountains where Horseback Riding, Golf, Boating, Swimming, Fishing and all outdoor sports are at their very best.

HOT SPRINGS NATIONAL PARK ARKANSAS

High in the Ozark Mountains where Medicinal Waters Bring Health

While you play – while you enjoy every outdoor sport at its superb best, drink and bathe in the health giving waters of Hot Springs. Find relief and cure from rheumatism, neuritis, kidney trouble, high blood pressure and kindred ailments in the 46 world famous Springs. Even a week or two at this renowned Spa will do you a world of good.



HOTEL MAJESTIC
BATH HOUSE AND APARTMENTS

NEW LOW RATES
In keeping with these times rates have been sharply reduced for rooms with and without bath. Also available apartments of 2, 3 and 4 rooms.

H. GRADY MANNING, *Pres.*

ket retaining strength due to optimism regarding first quarter mill needs.

St. Louis—Without appreciable buying, prices are strong and advancing on covering by shorts and scarcity of offerings. Mill buying is practically absent.

Birmingham, Ala. — Purchasers of iron and steel scrap are still buying hand to mouth and a car lot at the time is the general rule. Larger melters of heavy melting steel have much stock on hand.

San Francisco — Local steel mills are well supplied with heavy melting steel and movement, therefore, is light. No. 1 heavy melting steel holds around $10.25 a ton with No. 2 yard scrap $8.

Toronto, Ont. — Trading in iron and steel scrap while showing minor improvement continues slow in most grades. Steel mills show little interest and shipments of heavy melting steel and turnings are light. Demand for iron scrap, however, is sustained.

Warehouse

Warehouse Prices, Page 58

Cleveland — Warehouse interests do not believe the mill quantity differentials on plates and shapes under 6000 pounds, to become effective on shipments Jan. 1, will benefit them immediately. Mills will be less anxious to solicit this business, but the smaller sellers will continue to take it, though it involves considerable more clerical work. The extras are not viewed as sufficiently large to stimulate warehouse demand.

Chicago—Sales show surprising resistance to the downward trend usually encountered in November, orders for the month comparing favorably with those of October. Prices are unchanged.

Boston—Warehouse volume in November with most jobbers was about the same as the previous month, although the final week was slower. Buying is made up of numerous small orders, demand being well spread. Prices are unchanged.

New York—While orders decreased last week, aggregate November volume with most jobbers was on a par with the previous month. Buying continues miscellaneous and in small lots. Prices are steady and unchanged.

Philadelphia—While some jobbers report a slight decline in daily bookings for November, as compared with the preceding month, others report improvement. Whether this was sufficient to offset the holidays is doubtful, however. Prices are unchanged.

Detroit — November warehouse sales were about equal to those of October and the outlook for December is regarded as favorable.

Cincinnati—Warehouse business is close to tonnage of recent weeks. Ordering is close to immediate needs.

St. Louis—Warehouse interests report business in November slightly below October, due in part to fewer days and three holidays. However, the volume, favorably will exceed the same period a year ago.

Metallurgical Coke

Coke Prices, Page 55

Despite the fact that metallurgical coke users lend little support to the beehive or by-product market, domestic coke, now in its active season, is the chief outlet.

Foundries continue to purchase beehive coke at unchanged prices, paying $4.60, Connellsville, Pa., ovens for common brands and $5.10 or $5.35 for premium analyses. The furnace coke quotation continues to be $3.85 per ton for prompt shipment. A prominent beehive coke operator started several batteries of ovens in the Connellsville, Pa., region recently after a long period of idleness. Output was not placed on the market, but was diverted to allied subsidiary companies.

Chicago cokemakers have extended foundry coke prices into December at $8.50, ovens, for outside delivery, and $9.25 for Chicago delivery. November shipments were practically equal to those of October. Cincinnati specifications for by-product coke are unchanged, with prices firm. Birmingham, Ala., producers find shipments steady.

Coke By-Products

Coke By-Product Prices, Page 55

New York—Demand for distillates has slowed slightly, but prices remain firm with consumption about balancing production. Contracting for sulphate of ammonia remains steady for spring shipment. Phenol buying is steady, but in small lots. Naphthalene has been reduced to

STRIP STEEL
HOT and COLD ROLLED

in regular carbon Steel of any analysis including alloy steels

also

STAINLESS METALS
in
CHROME and CHROME NICKEL
analyses

SUPERIOR STEEL CORPORATION

General Office
3122 Grant Building
Pittsburgh, Pa.

Works at
Carnegie, Penna.

SALES OFFICES

2002 Girard Trust Bldg.
Philadelphia, Pa.

1017 Fisher Bldg.
Detroit, Mich.

Steel Sales Corp.
129 South Jefferson St.
Chicago, Ill.

H. L. Brown,
2001 Carew Tower
Cincinnati, Ohio

5.50c a pound in barrel lots. In 50-pound containers the price is 5.75c a pound. These prices apply on next quarter contracts which are beginning to be made. The bureau of supplies and accounts, navy department, Washington, closes Dec. 7 on 125 tons of phenol for delivery at White Plains, Md.

Ferroalloys

Ferroalloy Prices, Page 56

Sellers of ferromanganese have opened their books for first quarter at the unchanged price of $85, duty paid, Atlantic and Gulf ports. Prices on domestic spiegeleisen, 19 to 21 per cent, are expected to be extended, with lots up to 50 tons at $26, furnace, and 50 tons and over, $24.

Nonferrous Metals

Nonferrous Metal Prices, Page 56, 57

New York—Nonferrous metal prices held steady to firmer last week. Copper maintained its position well on code developments and progress toward curtailment of output abroad.

Copper—Primary producers extended the waiver of sales quotas through December and January. Moderate daily sales brought the total for the month well over 14,000 tons. Satisfactory progress was reported abroad toward an international marketing agreement. Curtailment to an average of output over the past few months was given approval of those producers attending a meeting in London last week. A proposal to form a pool for foreign copper also was well received. It was also felt that exports of copper produced domestically in this country should be restricted. Higher export copper prices were reflected in the scrap copper and brass market here.

Zinc—Prime western firmed at 3.70c, East St. Louis, and the higher level stimulated buying interest.

Lead—Lead sales have declined to carlot variety with prices steady at 3.35c, East St. Louis, and 3.50c, New York.

Tin—Straits sales were light to moderate and prices held closely to a fraction over the 51.00c level. Tin plate operations were slightly better but constant and active demand for tin was not apparent.

Aluminum—Market continued quiet with metal available at 19.00c to 21.00c, delivered.

Antimony—Asking prices for spot and prompt delivery firmed up at mid-week on inquiries here and a marked scarcity of Chinese supplies in this country. The closing price was 13.50c to 13.75c, duty paid New York.

Steel in Europe

Foreign Steel Prices, Page 58

London—(*By Cable*)—Practically every department of the British steel and iron markets are strong. The Middlesbrough area is meeting enlarged demand for hematite pig iron and fair tonnages have been shipped to Italy. Markets for steel products are active, with prospects good, and export trade improving. Rail mills are busy and have booked orders from South Africa and South America. Trade in galvanized sheets is fair, and tin plate is active.

The Continent reports export trade quiet with keen competition from the United States and Poland. Steelmakers in Poland have booked substantial Russian orders for steel.

Iron Ore

Iron Ore Prices, Page 56

Cleveland—Despite the relatively small lake iron ore shipments for the season—22,249,600 tons—producers do not expect a scarcity before shipments can be started next year. At the October rate of consumption there will be on hand at lower lake docks and furnaces May 1 approximately 28,500,000 tons, compared with 26,580,622 tons May 1 this year. Allowing for further gains in blast furnace operations, stocks May 1 are likely to be above the normal amount, 20,000,000 tons, and considerably over the industry's "safe margin" of 15,000,000 tons, with which to start the season.

The total lake shipment this year, as reported by the Lake Superior Iron Ore association, is 400 tons less than STEEL's estimate last week. The tonnages from the upper lake ports follow:

	1933	1934
Escanaba	1,647,980	1,543,737
Marquette	2,622,584	2,207,566
Ashland	2,400,769	2,286,766
Superior	5,835,101	6,996,206
Duluth	5,839,523	6,015,630
Two Harbors	3,277,941	3,199,695
Total	21,623,898	22,249,600

Further comparisons of annual shipment:

	Tons
1928	53,980,874
1929	65,204,600
1930	46,582,982
1931	23,467,786
1932	3,567,985
1933	21,623,898

NRA

(*Concluded from Page* 12)

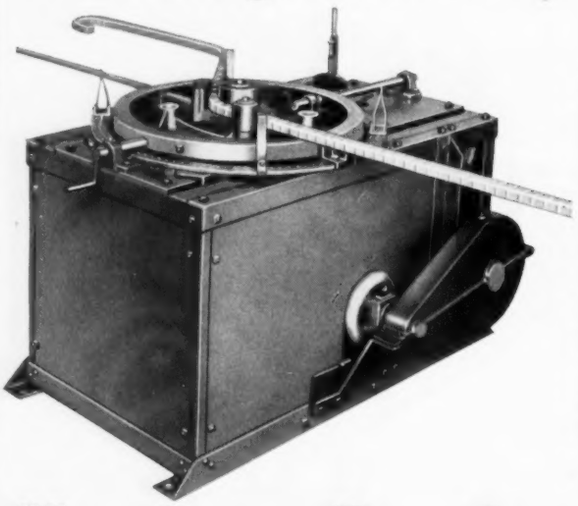
decentralization of the entire field force as a means of expediting the disposal of complaints. Ten regional offices will be established, the first being the southeastern at Atlanta.

BOOSTS TRADE COMMISSION

¶A report by William H. Davis, who is returning to NRA as a special ad-

Kardong Four-way Bender

Model D-2



The Model D-2 Kardong Four-way Bender was designed because of the popular demand for this type of Bender.
In the bending of large bars they do not have to be turned over to make the reverse second bends and in the 180 degree hook bars, after making the first hook the bending member is in position to make second hook by just switching resistance roller to opposite side.
The resistance roller plates are adjustable. The same construction is carried thru on this machine as in all of our benders and is guaranteed to give absolute satisfaction. Ask for catalogue of our complete line of reinforcing steel bar benders.

Kardong Brothers, Inc.

Minneapolis, Minn.

viser on compliance and enforcement problems, recommends greater use of the facilities and powers of the federal trade commission to enforce trade practice rules. The trade commission, which pioneered trade practice rules for many industries, is pleased with this enlargement of its powers.

CNRA last week: Approved a supplementary code for the architectural ornamental and miscellaneocs iron, bronze, wire and metal specialties manufacturing industry; interpreted the price filing provision in the job galvanizing metal coating industry; approved a supplement to the metal spinning and stamping code; and received additional trade practice rules for the mine tool code.

NAMED TO MANGANESE CODE

Captain H. B. Lebkicher has been appointed as administration member of the manganese industry code authority to serve without vote and without compensation by the industry for a term of six months. He is connected with the office of the assistant secretary of war.

CODE BUDGETS

Shovel, dragline and crane industry, $18,998; metallic wall structure industry, $17,260.

Equipment

Pittsburgh—Possibility continues strong that, with the solution to financing details, several Russian rolling mills will be awarded to Pittsburgh equipment concerns which have presented estimates on this work. According to present reports, it seems likely that the 4-high type of mill may be preferred. Other export business appears promising and a local equipment builder last week closed on a rolling mill for export to Japan.

Chicago—Equipment and machinery sales are in steady volume. Occasional betterment has developed from scattered purchases of large lots, this applying principally to orders received from a few automotive concerns. Miscellaneous inquiries for machine tools here involve only a few items. The outlook for better machinery demand from railroads still is unfavorable. Activity in foundry equipment continues relatively good.

Washington—To date the war department has made awards for about $480,000 worth of machine tool equipment, bids on which were opened Nov. 17 and 18. These awards have been distributed among 45 manufacturers throughout the country, and further releases are being made from day to day.

New York—Inquiry for machinery has improved materially with prospects of closing on considerable equipment during the next few weeks. One of the largest turbine builders in the East is expected to purchase a list of tools early in the year. Meanwhile notices of award continue to be made against close to 400 tools for New York technical schools.

Cleveland—Otis Steel Co. here recently has purchased a mechanical pressure blast for cleaning steel sheets. Similar equipment also has been purchased by Republic Steel Corp., Youngstown, O., for cleaning the edges of steel plate, by Wheeling Steel Corp., Wheeling, W. Va., for cleaning steel sheet for galvanizing, and by General Electric Co., Pittsfield, Mass., for cleaning transformer plates.

Boston—Inquiry is slightly improved and a fair number of orders have been received for equipment, following government bids.

Construction and Enterprise

New York

AMSTERDAM, N. Y.—Municipality is planning water filtration plant; PWA grant of $83,000 has been allotted. Nicholas S. Hill Jr., 112 East Nineteenth street, New York, engineer.

CONEY ISLAND, N. Y.—Department of water supply, gas and electricity, Municipal building, New York, is planning to construct a pumping station to cost $503,000; PWA funds allotted. M. D. Metcalfe, 1310 Bedford avenue, Brooklyn, N. Y., architect. J. Goodman, Municipal building, New York, chief engineer.

ROCHESTER, N. Y.—Hub Oil Co. has awarded contracts for construction of a bulk gasoline and petroleum products distributing plant. Plans provide for a total storage capacity of 500,000 gallons.

SARATOGA SPRINGS, N. Y.—Municipality will take bids early in December for filter plant and pumping station. N. S. Hill Jr., 112 East Nineteenth street, New York, engineer.

Pennsylvania

PHILADELPHIA—Frankford arsenal, Administration building, will take bids Dec. 17, circular 173, on 12 2½-kilowatt, 115-volt, 60-cycle, a.c. gasoline electric generating units.

SHALER, PA.—Town (Allegheny county) has been allotted $414,000 for improvement to waterworks.

Indiana

FORT WAYNE, IND.—F. J. Schwabe & Son, manufacturers of wood and met-

CROSBY STAMPINGS

Since 1896 the Crosby plant has been devoted, exclusively, to designing and producing Sheet Metal Stampings. Avail yourself of this experience. Send us your next stamping problem and watch results.

Manufacturers *IDEAL TROLLEY WHEELS*

THE CROSBY COMPANY

BUFFALO, N. Y.

Branch Offices: **New York, Philadelphia, Pittsburgh, Cleveland, Detroit, Chicago.**

al patterns, recently has reorganized as the Schwabe Pattern Co. Inc. R. J. Schwabe is president.

SOUTH BEND, IND.—Hunter Co., 608 South Dearborn street, Chicago, engineer, is taking bids on 350-kilowatt generating equipment, 150-horsepower high pressure boilers, pumps, switchboard equipment and electric motors for the Oliver hotel here.

Illinois

CHICAGO — International Distilled Products Corp., 1166 Milwaukee avenue, has been formed by Z. George Jaworowski, Adele Walton and Isabel Raczynski, to operate a distillery.

CHICAGO—Peerless Hairpin Corp., 14 North May street, has been organized to manufacture articles from iron and steel, by George C. Potts, Arthur Carlsten and M. V. Carlsten. Correspondent: Arthur Carlsten, 407 South Dearborn street.

CHICAGO—Filtro Faucet Mfg. Co., 1840 West Thirty-third street, has been incorporated by Jack Rubinovitz, Louis Smith and Ernest Tromin, to manufacture iron, steel and other metals. Correspondent: Hector A. Brouillet, 127 North Dearborn street.

CHICAGO—James H. Jones Corp., 430 South Green street, has been incorporated to manufacture printing machinery, book binding machinery and box making machinery, by Elizabeth Ohl, Estelle Black and Albert A. Wind. Correspondent: Wind & Wind, suite 2006, 100 North LaSalle street.

FREEPORT, ILL.—City has been granted PWA loan for $291,000 for intercepting sewer and sewage treatment plant.

MT. OLIVE, ILL.—City has received loan of $115,000 from PWA for waterworks improvements.

Missouri

KANSAS CITY, MO.—A. F. Spengler, Oklahoma City, Okla., operating as the Superior Tool Co., has leased a building at northeast corner of Fourteenth street and Montgall avenue and will move its tool manufacturing plant here.

OAK GROVE, MO.—City will open bids soon for waterworks improvements, including tank and tower and pumps, to cost about $40,000. Black & Veatch, engineers, 700 Mutual building, Kansas City, Mo.

Oklahoma

YUKON, OKLA.—T. A. and Joe Dobry are planning to erect a flour mill and grain elevator of 1000 barrel daily capacity, to cost about $500,000.

Wisconsin

MAYVILLE, WIS.—Mayville Brewing Co., H. W. Ogren manager, has let contracts for a bottling plant, 35 x 45 feet, and will install new bottling machinery.

MILWAUKEE—Imperial Sign Co., 1027 North Eleventh street, manufacturer of neon light signs, will add a sheet metal department. John and Frank Imp are owners.

MILWAUKEE—S. Michelstetter, formerly with Reliable Knitting Works, has bought the Imperial Knitting Co., 2745 North Third street, and will add considerable equipment.

MILWAUKEE—Hydro Air Mfg. Co. has been incorporated to manufacture hydro air cleaners, by E. B. Floren, K. G. Shelp and C. B. Smith.

MILWAUKEE—Sterling Engineering Co., 3738 North Holton street, has started construction of a new instant water-heating unit for application to domestic heating systems. The unit includes a circulating pump and can be used with gas burner, oil burner, hand or stoker-fired boiler.

PRINCETON, WIS.—PWA has allotted loan of $100,000 to city for construction of waterworks system.

New Jersey

BRIELLE, N. J.—Borough has been granted PWA loan of $40,000 for waterworks improvements.

ISLAND HEIGHTS, N. J.—Borough has been granted loan of $66,000 for construction of sewage disposal plant.

Minnesota

DULUTH—Minnesota state highway department, 1246 University avenue, St. Paul, plans construction of a 1-story maintenance garage and machine shop, 38 x 42 feet, and 2-story office building, 29 x 39 feet.

RUSSELL, MINN.—V. C. Johnson, village clerk, will receive bids until Dec. 6 for construction of a municipal waterworks system, including a 50,000 or 75,000-gallon steel water tank on 110-foot tower. Druar & Milinowski, 830 Globe building, St. Paul, are consulting engineers.

SOUTH ST. PAUL, MINN.—Board of education, E. L. Sloan clerk, has authorized purchase of a drill press for the manual training department.

WINONA, MINN.—Maj. Dwight F. Johns, district engineer of the war department, 615 Commerce building, St. Paul, will receive bids until Dec. 20 for construction of dam No. 5A in the Mississippi river, for which $2,450,000 has been allotted. Dam will consist of steel service bridge, 5 roller gates and 5 tainter gates, and will require 82,640 square feet of steel sheet piling, 513 tons of structural steel, 138 tons of movable structural steel, 310 tons of reinforcing steel, 32 tons of forged steel and 28 tons of castings.

Nebraska

SUTHERLAND, NEBR.—Platte valley public power and irrigation district, Gerald Gentleman secretary, North Platte, Nebr., will receive bids until Dec. 5 for construction of sections A and B of the supply canal, part of the $7,500,000 Sutherland irrigation and power project. These sections will require 500 tons of reinforcing steel. Contracts have been awarded Omaha Steel Works, Omaha, Nebr., for five diversion dam gates and two radial gates for power canal; to R. Hardesty Mfg. Co., Denver, for eight gates for skimmer wier diversion dam; to Phillips & Davies Inc., Kenton, O., for two gates for roller bearing outlet and two for intake. Parsons, Klapp, Brinkerhoff & Douglas, 142 Maiden Lane, New York, are consulting engineers.

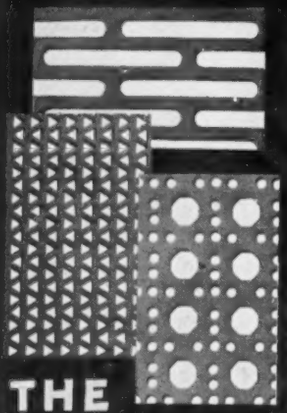
Wyoming

YELLOWSTONE PARK, WYO.—National park service will receive bids until Dec. 17 for construction of a utility building at Mammoth hot springs, 72 x 256 feet, to include garage, machine and mechanical shops. Guy D. Edwards, Yellowstone Park, Wyo., is acting superintendent.

Ohio

AKRON, O.—Johnson Steel & Wire Co., Worcester, Mass., has purchased a building and tract of land in Cuyahoga Falls, a suburb of Akron, O., for a branch plant. In addition to the building now on the property, a new plant will be erected and equipped for the

PERFORATED METAL



FOR EVERY REQUIREMENT

including Architectural Grilles, Safety Guards and Screens of every sort in Steel, Brass, Bronze, Copper, Zinc, Tin Plate, Monel, Lead, Stainless Iron, etc.

Write for complete information

THE HARRINGTON & KING PERFORATING CO.

5634 FILLMORE STREET — CHICAGO, ILL.

New York Office, 114 Liberty Street

manufacture of steel wire. J. H. Patterson, South Bend, Ind., has been named general manager of the Cuyahoga Falls plant, which will go into production early in 1935.

BRYAN, O.—Aro Equipment Corp. is planning to expand its manufacturing facilities. Among new items to be added to the Aro line will be the Aro motor-oil dispenser.

CINCINNATI—J. D. Whitmore, engineer, care of Sun Oil Co., Woodville street and Belt railway, Toledo, O., is taking bids for a bulk oil plant for Sun Oil Co., 1608 Walnut street, Philadelphia. Estimated cost is over $30,000.

CLEVELAND—Weld-Rite Inc. has leased a 1-story brick factory building at 1440 East Forty-first street and will do welding of all types, especially home and industrial and boiler work.

FLUSHING, O.—Village has been granted PWA loan of $60,000 for construction of waterworks.

MIDDLEPORT, O.—Village, D. C. Wohler clerk, is preparing plans for waterworks and distribution system, including elevated tank of 1,000,000-gallon capacity. Cost is estimated at about $36,000. C. J. Simon, Van Wert, O., engineer.

NEW CONCORD, O.—Village has been allotted $30,000 PWA funds for improvements to waterworks system.

Florida

ARNOLD, FLA.—Arnold Fruit Co. is planning to install machinery in the Seaboard Air Line Railway warehouse at the foot of Julia street, to replace plant recently damaged by fire.

JACKSONVILLE, FLA.—Municipality is planning to erect an electric power plant addition, to cost about $130,000. Taylor Engineering Co., Jacksonville, Fla., engineer.

Kentucky

GREENSBURG, KY.—Green County Relief administration is considering establishment of plant at Liletown, Ky., for manufacture of wood bedsteads.

LOUISVILLE, KY.—J. B. Jennings has contract for 80 x 160-foot addition to plant of Kentucky Macaroni Co., Floyd street at Southern railway. Heating plant and additional sprinkler equipment will be installed; mechanical contracts to be let soon. Cost is estimated at about $22,000.

Louisiana

JACKSON, LA.—City, F. P. Joseph, consulting engineer, Glenmora, La., will probably call for bids in about 60 days on waterworks improvements, including pumping plant, motor-driven pump, air compressor, 25,000-gallon elevated tank and pumps.

WEST MONROE, LA. — Quachita Parish Gravity Drain District No. 1, Sam H. Humphries, secretary, will receive bids in about 60 days for pumping station, pumping machinery, etc., to cost approximately $75,000.

Maryland

BALTIMORE—Edward Heinz 1908 Light street, is considering building a 1-story meat packing plant. C. W. Anderson, engineer, 411 West Camden street.

BALTIMORE—Balmar Corp., Clipper road, Woodberry, Md., has applied for permit to erect a shipping and storage building. Carlstrand Engineering Co., 10 West Chase street, engineer and builder.

Mississippi

NATCHEZ, MISS.—Mississippi Pulp Co. will soon start work on equipping plant of Mississippi Match Co. with machinery for match splints. Engineers are now working on plans.

North Carolina

WILMINGTON, N. C.—Broadfoot Iron Works Inc., foot of Church street, has been engaged to do engineering work for a newly-organized company, and wants prices and data on milling equipment for handling pyrophyllite, a substance similar to soapstone, including conveyors, motors, cyclone regrinder, etc.

South Carolina

CLIFTON, S. C.—Clifton Mfg. Co. has improvement program under way at its power plant used for service at No. 1 and 2 units and Converse mills, and will install new equipment.

Tennessee

DAYTON, TENN.—City is planning to start construction of power lines from Athens to Dayton; will purchase power from TVA. J. B. Kingsolver, Knoxville, Tenn., will be in charge.

West Virginia

HURRICANE, W. VA.—Town has been granted PWA loan of $51,000 for water supply system.

Arkansas

CARAWAY, ARK.—Allen Cooperage Co. is planning to erect a wood products plant to replace its plant recently damaged by fire. Total cost is $40,000 or more.

Texas

GOOSE CREEK, COADY, TEX.—T. L. Culpepper, chairman of committee for constructing water, sewer and light plant, will apply for loan of $80,000.

HOUSTON, TEX.—Continental Can Co. Inc., Pershing Square building, New York, is planning to spend about $400,000 for a 3-story addition to its plant here.

KERRVILLE, TEX.—City, R. Holdsworth, mayor, opens bids about Dec. 15 for equipment for a butane gas plant addition; will install air and butane mixing machines, electric motors and color mixer machine. A. P. Hancock, construction engineer, Kerrville, Tex.

MARQUEZ, TEX.—City will receive bids Dec. 11 for waterworks, including water well, pumping equipment, elevated tank and tower, water distribution system, and buildings for pump station. Southwest Engineering Co., engineer, Littlefield building, Austin, Tex.

ODEM, TEX.—City, E. S. Butler, mayor, receives bids Dec. 7 for waterworks system, including water well and turbine pump, elevated tank, two water distribution systems; has loan and grant of $31,000. David M. Duller, engineer, 1618 Second National Bank building, Houston, Tex.

Iowa

CRESTON, IOWA—Town will hold an election Dec. 14 on proposal to purchase Taxpayers Municipal Waterworks Plant at a cost of $185,000, and to spend $40,000 for improvements.

Buffalo WIRE . . . .

"A BETTER WIRE CLOTH"

ANNEALING
DIPPING AND
CONVEYING
BASKETS

Just one item in a long line of "Buffalo" woven wire products!

For pickling, plating, washing, dipping, annealing, conveying and brewing.

Made in any style, size, shape, material or finish. Send specifications.

Also manufacturers of "Buff-aloy" the new Abrasive Resistant Wire Screen.

BUFFALO WIRE WORKS CO.
INCORPORATED
(Formerly Scheelers Sons)
437 Terrace BUFFALO, N. Y.
Philadelphia Office and Warehouse: 11 South 7th Street

WHERE-TO-BUY

A classified list of advertisers according to products. ¶Index to advertisements gives page number of any advertiser.

ABRASIVES (Polishing)
Carborundum Co., The, Niagara Falls, N. Y.
Norton Co., Worcester, Mass.

ACCUMULATORS
Morgan Engineering Co., The, Alliance, O.

ACETYLENE
Air Reduction Sales Co., 60 East 42nd St., New York City.
Carbo-Oxygen Co., Benedum-Trees Bldg., Pittsburgh, Pa.
Linde Air Products Co., 30 E. 42nd St., New York City.

ACID-PROOF LININGS
Ceilcote, The Co., Rockefeller Bldg., Cleveland, O.

ACIDS (Pickling)
American Chemical Paint Co., Ambler, Pa.

AIR COMPRESSORS—See COMPRESSORS (Air)

AIR CONDITIONING EQUIPMENT
Sturtevant, B. F., Co. Hyde Park, Boston, Mass.

AIR PREHEATERS
Sturtevant, B. F., Co., Hyde Park, Boston, Mass.

ALLOYS—See FERROALLOYS

ANGLES, CHANNELS—See BEAMS, CHANNELS, ANGLES

ANGLE IRON BENDERS
Excelsior Tool & Machine Co., Ridge and Jefferson Aves., East St. Louis, Ill.

ANNEALING BOXES
Union Steel Casting Co. 62nd & Butler Sts., Pittsburgh, Pa.

ANODES (All Types)
The Udylite Co., 1615 E. Grand Blvd., Detroit, Mich.

AXLES
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.
Standard Steel Works Co., Burnham, Pa.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.

BABBITT METAL
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

BANDS—See HOOPS AND BANDS

BANDS (Iron and Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

BAR BENDERS
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.

BARGES (Steel)
American Bridge Co., Frick Bldg., Pittsburgh, Pa.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
McClintic-Marshall Corp., Bethlehem, Pa.

BARRELS (Plating)
The Udylite Co., 1615 E. Grand Blvd., Detroit, Mich.

BARS (Alloy)
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Timken Steel & Tube Co., Canton, O.

BARS (Concrete Reinforcing)
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle, St., Chicago, Ill.
Inland Steel Co., 38 S. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Youngstown Sheet & Tube Co., Youngstown, O.

BARS (Iron)—See IRON (Bar)

BARS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Timken Roller Bearing Co., The, Canton, O.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

BEAMS, CHANNELS, ANGLES, ETC.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

BEARINGS (Ball)
Bantam Ball Bearing Co., The South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
New Departure Mfg. Co., Bristol, Conn.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.

BEARINGS (Bronze)
Shenango-Penn Mold Co., Dover, O.

BEARINGS (Journal)
Bantam Ball Bearing Co., The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt, Roller Bearing Co., P. O. Box 476, Newark, N. J.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Roller)
Bantam Ball Bearing Co., The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., The. Canton, O.

BEARINGS (Roll Neck)
Bantam Ball Bearing Co., South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
Ryerson, Jos. T. & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., Canton, O.

BEARINGS (Thrust)
Bantam Ball Bearing Co., The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., The, Canton, O.

BENDING AND STRAIGHTENING MACHINES
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.
Morgan Engineering Co., The, Alliance, O.
Thomas Spacing Machine Co., Pittsburgh, Pa.

BENZOL AND TOLUOL RECOVERY PLANTS
Koppers Construction Co., 1438 Koppers Bldg., Pittsburgh
Youngstown Sheet & Tube Co., Youngstown, O.

BILLET CHIPPERS—SEE CHIPPERS (Billet)

BILLETS (Alloy and Carbon Steel)
Alan Wood Steel Co., Conshohocken, Pa.
Andrews Steel Co., Newport, Ky.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Republic Steel Corp., Youngstown, O.
Timken Steel & Tube Co., Canton, O.
Washburn Wire Co., Phillipsdale, R. I.

BILLETS (Forging)
Alan Wood Steel Co., Conshohocken, Pa.
Andrews Steel Co., Newport, Ky.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Standard Steel Works, Co., burnham, Pa.
Timken Steel & Tube Co., Canton, O.

BILLETS AND BLOOMS
Alan Wood Steel Co., Conshohocken, Pa.
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.
Standard Steel Works Co., Burnham, Pa.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Timken Steel & Tube Co., Canton, O.
Youngstown Sheet & Tube Co., Youngstown, O.

BLAST FURNACE SPECIALTIES
Bailey, Wm. M., Co., 702 Magee Bldg., Pittsburgh, Pa

BLAST FURNACES—See FURNACES (Blast)

BLOWERS
General Electric Co., Schenectady, N. Y.
Ingersoll-Rand Co., Phillipsburg, N. J.
Strong, Carlisle & Hammond Co., The, 1400 W. 3rd St., Cleveland, O.
Sturtevant, B. F., & Co., Hyde Park, Boston, Mass.

BOILER HEADS
Bethlehem Steel Co., Bethlehem, Pa.

BOILER TUBES—See TUBES (Boiler)

BOILERS
Babcock & Wilcox Co., The, 85 Liberty St., New York City.
Murray Iron Works Co., Burlington, Iowa.

BOLT AND NUT MACHINERY
Landis Machine Co., Waynesboro, Pa.

BOLT CLIPPERS
H. K. Porter, Inc., Everett, Mass.

BOLTS
Bethlehem Steel Co., Bethlehem, Pa.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Jones & Laughlin Steel Co., Jones & Laughlin Bldg., Pittsburgh, Pa.
Oliver Iron & Steel Corp., S. 10th & Muriel Sts., Pittsburgh, Pa.